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Name-bearing type specimens in the Canadian National Collection of Insects, Arachnids & Nematodes (CNC): Blattodea, Dermaptera, Notoptera, Mecoptera, Megaloptera, Myriapoda, Neuroptera, Odonata, Orthoptera, Phthiraptera, Pseudoscorpiones, Psocoptera, Raphidioptera & Siphonaptera

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Abstract

A catalogue is provided for the name-bearing types of most of the less diverse arthropod groups deposited in the Canadian National Collection of Insects, Arachnids & Nematodes (CNC). There are 90 name-bearing types of Myriapoda [Chilopoda (3 types), Diplopoda (2)], Arachnida [Pseudoscorpiones (1)], and Insecta [Blattodea (1), Dermaptera (1), Notoptera (3), Mecoptera (3), Megaloptera (2), Neuroptera (11), Odonata (2), Orthoptera (5), Phthiraptera (2), Psocoptera (10), Raphidioptera (1) and Siphonaptera (43)]. Three myriapod syntypes are represented by an unknown number of specimens. Holotypes for *Plesiorobius canadensis* Klimaszewski & Kevan (Neuroptera) and *Sphaeropsocoides canadensis* Grimaldi & Engel (Psocoptera) are amber-preserved fossils. Portions of the holotype of *Chaetospania assamensis* Sakai are considered lost, as are an unknown number of syntype specimens for the centipede species *Ethopolys alaskanus* Chamberlin and *E. integer* Chamberlin. Collembola types were treated in Stebaeva *et al.* (2016), and Araneae, Ephemeroptera, Plecoptera and Trichoptera will be treated in future catalogues, completing inventories for the orders without associated research staff in the CNC. Definitions of relevant type specimens are provided, as is a preliminary summary of all 16,710 name-bearing type specimens held by the CNC, including those of the more diverse orders for which there are associated research staff: Nematoda, Acari, Coleoptera, Diptera, Hemiptera/Thysanoptera, Hymenoptera and Lepidoptera.

Key words: Arthropoda, Insecta, Myriapoda, Arachnida, holotype, neotype, lectotype, syntype, catalogue

Introduction

The Canadian National Collection of Insects, Arachnids & Nematodes (CNC) is one of the largest collections of its kind in the world. It is estimated to hold over 17 million specimens from 185 countries (out of 195 UN member and observer states) and Antarctica, with an especially thorough representation of the Canadian fauna, with over 50% of digitized material being Canadian. This is the second in a series of papers cataloging the name-bearing types of the CNC that belong to the less diverse orders that do not have associated research staff, the first being a catalogue of Collembola that also included a listing of paratypes (Stebaeva *et al.* 2016). This second work will focus on name-bearing types of the remaining groups except for Araneae, Ephemeroptera, Plecoptera and Trichoptera, which will be treated individually in future works.

Name-Bearing Types. Some terminology should be clarified before individual specimens are discussed. A *name-bearing type* at the specific and subspecific levels is a single individual or series of specimens that provides the objective standard of reference whereby the application of the name of a nominal taxon can be determined (ICZN, 1999). These types are a direct link to the name of that taxon, representing that taxonomic concept in the physical world for the scientific community. It links species descriptions to actual organisms, and acts as the physical gold standard for comparative purposes. This aids in characterization of the taxon and the identification of

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other newly discovered specimens, and facilitates the delimitation and description of other similar or closely related species.

All categories of name-bearing types are represented in the CNC: *holotypes* (single specimens designated as the name-bearing type); *syntypes* (one or more specimens in a type series if a single specimen is not clearly designated as the holotype, with the entire series constituting the name-bearing type); *lectotypes* (a single syntype selected in a later publication to be the single name-bearing type); and *neotypes* (a "replacement" name-bearing type if the original type is no longer believed to exist, being either destroyed or lost).

Additional specimens in the CNC were described or labeled as *cotypes*, a term that has historically been used in the sense of both syntype and paratype, but it is not regulated by *The International Code of Zoological Nomenclature* and its usage is now discouraged (ICZN 1999). One category of specimen sometimes confused for a name-bearing type is the *allotype*, a specimen of the opposite sex to the holotype designated in the original description, but this is actually a paratype and has no special separate status.

CNC Type Holdings. The present paper is concerned with the documentation of individual specimens and their associated data, and will therefore focus on numbers of name-bearing type *specimens*. As a result, the number of specimens listed will be larger than the number of *names* to which type specimens are attached.

As of the writing of this paper, the number of name-bearing type specimens held in the CNC is estimated to be 16,710, but this number will certainly change over time. One obvious reason for this expected change is that new types will be deposited in the CNC as new taxa are discovered and described by local and international experts. For existing type specimens, numbers will increase or decrease for a number of reasons. Firstly, types may have been missed if inventories were conducted while specimens were out on loan, if specimens were not clearly labeled as types and overlooked, if types were discovered to have been mistakenly deposited in the incorrect institution, or if types from other institutions are sold or otherwise transferred to the CNC. Secondly, a lectotype may be designated from a series of syntypes through the action of a subsequent author, reducing the number of name-bearing type specimens for that taxon from many to one. Additionally, clarification may be provided for specimens through the activities of studies such as this, where the primary literature and the specimens themselves are re-examined. For example, some specimens believed to be paratypes may prove to be syntypes if a single specimen among the type series was not properly designated as the name-bearing type by the original author. This investigation may also determine if the incorrect specimen was labeled as the name-bearing type, if the correct specimen was provided with the incorrect label, or if incorrect or incomplete data were published in the original description or on the specimen label. Examples of all of these possibilities have been found in this and parallel studies.

For these reasons and others, the practice of curating, inventorying and verifying type material using both the original literature and the physical specimens themselves are instrumental to assessing collection holdings accurately. This ultimately ensures the security of both type and non-type specimens, and makes material more widely available to the community for scientific inquiry.

While this catalogue is a stable, long-term record of name-bearing types held by the CNC at the time of publication, it will of course not reflect any new additions or findings. In order to maintain live, continuous updates to these data, the CNC hosts searchable specimen and taxonomic databases that are available at: http://www.cnc-ottawa.ca/taxonomy/TaxonMain.php. New accessions to the collection are viewable here, as are updates to existing specimen records, including those for the types discussed in this paper and those to follow. High resolution photographs will also be provided for most types. These images will minimally include label and habitus images (as in Figs 1-6), but may also include other aspects such as head, wing and genitalia.

Taxonomic Representation. The CNC presently houses name-bearing types of two animal phyla – Nematoda and Arthropoda. Among the arthropods, types are represented by the subphylum Myriapoda for both Chilopoda (centipedes) and Diplopoda (millipedes), the subphylum Chelicerata for the subclass Acari (mites) and the orders Araneae (spiders) and Pseudoscorpiones (pseudoscorpions), and the subphylum Hexapoda for the class Collembola (spring-tails) and 20 orders of Insecta. The total number of types by major taxonomic grouping is listed in Table 1.

Due to the size of the CNC, maintenance and development of holdings are necessarily divided into multiple curatorial units, discussed in Lonsdale & Huber (2012). Seven of these units contain active research scientists that care for Acari, Nematoda, Coleoptera, Diptera, Hemiptera/Thysanoptera, Hymenoptera and Lepidoptera. The eighth unit, which includes the Collection Manager, is the Collections Unit, which cares for the remaining smaller orders that do not have associated research staff. The informal title of "Minor Orders" given to this assemblage of taxa is a bit of a misnomer, however, as it includes the remaining 25 classes and orders of Hexapoda, the

myriapods, the spiders, all remaining chelicerates and an assortment of other taxa; it also includes 1565 name-bearing type specimens, or 10% of the total.

Skidmore (1993) provided a catalogue of types for the minor terrestrial orders, but this contains errors and omissions, and requires updating. Lewis *et al.* (1993) published an annotated catalogue of Siphonaptera types in the CNC the same year. Stebaeva *et al.* (2016) provided the update for Collembola, listing 94 name-bearing type specimens (holotypes and syntypes) for 57 species; paratypes were also included. The present paper will collectively detail the 90 name-bearing type specimens of Myriapoda (5 name-bearing type specimens, three of which are represented by an unknown number of specimens), Pseudoscorpiones (1), and the insect orders Blattodea (1), Dermaptera (1), Notoptera (3), Mecoptera (3), Megaloptera (2), Neuroptera (11), Odonata (2), Orthoptera (5), Phthiraptera (2), Psocoptera (10), Raphidioptera (1) and Siphonaptera (43). Holotypes for *Plesiorobius canadensis* Klimaszewski & Kevan (Neuroptera) and *Sphaeropsocoides canadensis* Grimaldi & Engel 2006 (Psocoptera) are amber-preserved fossils. Additional lost types known or thought to have been deposited in the CNC are also discussed.

Separate catalogues treating the name-bearing types of the remaining "Minor Orders" will be provided at a later date: Araneae (118), Ephemeroptera (235), Plecoptera (39) and Trichoptera (989).

Among the major curatorial groups, thorough, specimen-level inventories of types have been provided for the orders Diptera (Brooks *et al.* 2015) and Coleoptera (McNamara 1993). Similar inventorying of type material has or is being paralleled among the remaining curatorial units to develop a complete verified list of name-bearing types in the CNC, much of which is already presently available on the CNC specimen database and has contributed to the numbers provided in Table 1.

Lost Types. For the taxa studied here, name-bearing types of three species are considered lost. These include an unknown number of male and female syntypes of the centipedes *Ethopolys alaskanus* Chamberlin and *E. integer* Chamberlin. In Dermaptera, the body is missing from the *Chaetospania assamensis* Sakai holotype, although some dissected material remains as discussed in the comments section for that species below.

J. Wagner Types. Clarification should be provided for the types of ten flea taxa described by J. Wagner in three papers (Wagner 1936a, 1936b, 1940), as only two of these types were originally noted as being deposited in the CNC: *Megarthroglossus longispinus* var. *exsecatus* Wagner 1936b and *M. pygmaeus* Wagner 1936b. The rest were noted as being deposited in either the University of Vancouver [= G.J. Spencer Collection, University of British Columbia] (*Megabothris adversus* Wagner 1936a; *Callistopsyllus paraterinus* Wagner 1940; *Neopsylla scapani* Wagner 1936a; *Nycteridopsylla vancouverensis* Wagner 1936a) or the collection of G.J. Spencer (*Nearctopsylla hygini columbiana* Wagner 1940; *Ceratophyllus petrochelidoni* Wagner 1936a (implied); *Megarthroglossus spenceri* Wagner 1936b; *Thrassis spenceri* Wagner 1936a [later (Wagner 1936b) noted as being in a collection in Kamloops]). Other types from those papers noted as being deposited in other private collections need not concern us here. Unfortunately, there is no documentation to reveal the history of transfers from these British Columbian collections to the CNC, but specimens originating in these collections are tentatively assumed to have been legally acquired until evidence can be provided to suggest otherwise.

One additional type from this series of papers was noted as being deposited in the collection of G.J. Spencer: *Megarthroglossus similis* Wagner 1936b. This species was described from two male syntypes with the following collection data: British Columbia, Beaverdell, 23.xi.1930, ex *Neotoma cinerea occidentalis*, G.J. Spencer. Smit & Wright (1965) located one male in the Wagner collection, Hamburg, which they designated the lectotype; the second male was noted as being lost.

Materials & methods

Type specimens are presented alphabetically by original specific epithet within each order/class. Original publications containing species descriptions were examined and are listed in the Literature Cited section.

Each specimen entry is formatted as follows. The specific epithet is followed by the author, year, and original genus. If the species is currently considered a junior synonym, has been recombined, or is under a different subspecific classification, then the next line will present the valid name. The following line will describe the sex and state of preservation of the type. The next line will be the verbatim collection data as they appear on the label(s). This will be followed by interpreted collection data. Text on other labels associated with taxonomic

identification will appear verbatim in the following line as "determination". The final line will be "comments", and will present other relevant information, including the physical condition of the specimen, nomenclatural notes, data from the description or other sources, and larger discrepancies between the physical and published data, including errors.

TABLE 1. Number of name-bearing type specimens in the CNC by higher taxon. * - Groups treated in the present study for which all CNC name-bearing type specimens are listed.

Higher Taxon		# name-bearing type specimens
Major curatorial units		
	Nematoda	306
Hexapoda	Coleoptera	2,718
	Diptera	5,117
	Hemiptera	765
	Hymenoptera	4,003
	Lepidoptera	1,375
	Thysanoptera	40
Chelicerata	Acari	821
Smaller taxa without associated research staff		
Myriapoda	Chilopoda*	3
	Diplopoda*	2
Hexapoda	Blattodea*	1
	Collembola	94
	Dermaptera*	1
	Ephemeroptera	235
	Mecoptera*	3
	Megaloptera*	2
	Neuroptera*	11
	Notoptera*	3
	Odonata*	2
	Orthoptera*	5
	Phthiraptera*	2
	Plecoptera	39
	Psocoptera*	10
	Raphidioptera*	1
	Siphonaptera*	43
	Trichoptera	989
Chelicerata	Araneae	118
	Pseudoscorpiones*	1
	TOTAL	16,710

"Interpreted data" differs from verbatim data in several respects. First, it will present the details of the collection event using standardized order and formatting. It will use contemporary geopolitical units and provide latitude and longitude where named localities could be verified and geocoded with confidence, although the exact locations of field sites around these points are expected to differ somewhat; when a municipality is given as the collection site, latitude and longitude are derived from the approximate centre of the municipality. It will incorporate additional locality information from published descriptions and other sources, convert feet to meters (when provided), and will present current vertebrate taxonomy for host species (sourced from GBIF (2018),

Lepage (2018), Wilson & Reeder (2005)). Lastly, if there are any errors on the label or in the published description, corrected data will be presented unless there are any reasonable uncertainties as to the reliability of those data, which will be discussed more thoroughly in the comments section.

The CNC or CNCI alphanumeric code associated with each specimen is a unique identifier connecting the physical specimen to a database record. The use of CNC Type Numbers has now been abandoned because these were often applied to multiple specimens in a type series, and are therefore not unique, or they were only applied to secondary types if a name-bearing type was not deposited; these Type Numbers are included nonetheless, along with additional file or code numbers if included on labels.

Name-Bearing Type Catalogue

A) Arachnida

Pseudoscorpiones

volcanus Muchmore, 1977, ***Tyrannochthonius***
holotype (1 male, slide)
Verbatim: ChiapAs, Mexico Volcan tzontchuitz 8mi. NE San Cristobal de las CASAS 14 May 1969 litter J.M. Campbell WM 3043.01004 / CNC 348424.
Interpretive data: **MEXICO**. **Chiapas**: Volcán Tzontehuitz, 12.9km Northeast of San Cristóbal de las Casas, 16°49′7″N 92°34′54″W, litter, 14.v.1969, J.M. Campbell, WM 3043.01004, CNC348424.
Determination: HOLOTYPE / TyRAnnochthonius volcanus Muchmore ♂ det. W.B. Muchmore 1974.

B) Myriapoda

Chilopoda

alaskanus Chamberlin, 1919a, ***Cryophilus***
Valid name: *Arctogeophilus glacialis* (Attems, 1909)
syntype (1 ex, ethyl alcohol)
Verbatim: Alaska: Nome Aug-1916- F. Johansen / NOME, ALASKA, Aug-1916 F. Johansen / CNC 627300.
Interpretive data: **USA. Alaska**: Nome, 64°30′0″N 165°24′0″E, viii.1916, F. Johansen, hand collected, CNC Type No. 3090, CNC627300.
Determination: Type Cryophilus alaskanus Chamb. / HOLOTYPE Cryophilus alaskanus Chamb No. 3090.
Comments: Chamberlin (1919) described this species from two specimens (one male and one female implied), neither was explicitly or implicitly designated holotype; the location of the second syntype is unknown. The specimen is in three pieces.

alaskanus Chamberlin, 1919a, ***Ethopolys integer***
syntype (male/female [number unknown] preparation unknown)
Interpretive data: **USA. Alaska**: Forrester Island, 54°48′19.31″N 133°31′48.92″W, Ronald and Prof. H. Heath; Sitka, 57°3′11″N 135°19′48″W, CNC627589.
Comments: Lost—unique identifier added to placeholder vial for eventual addition to specimen. Depository stated to be CNC in Chamberlin (1919a). Chamberlin (1925) states the type locality as Forrester Island, Alaska, but did not explicitly designate a specimen as the holotype.

integer Chamberlin, 1919a, ***Ethopolys***
syntype (male/female [number unknown] preparation unknown)
Interpretive data: **USA. Washington**: Pullman, 46°44′N 117°10′W; Wenatschee, 47°25′24″N 120°19′31″W; **Oregon**: Corvallis, 44°34′N 123°17′W, CNC627588.

Comments: Lost - unique identifier added to placeholder vial for eventual addition to specimen. Depository stated to be CNC in Chamberlin (1919a). Chamberlin (1925) states the type locality as Pullman, Washington, but did not explicitly designate a specimen as the holotype. Genus name misspelled "*Ethpolys*" in description.

Diplopoda

hewitti Chamberlin, 1919b, ***Bollmaniulus***
Valid name: *Parajulus hewitti* **(**Chamberlin, 1919b)
syntype (male/female [number unknown], ethyl alcohol)
Verbatim: R.V. Chamberliin [sic] Agassiz B.C. 4-IX-1918 C.G. Hewitt.
Interpretive data: **CANADA**. **British Columbia**: Agassiz, 49°14′20.10″N 121°45′57.40″W, 4.ix.1918, C.G. Hewitt, CNC627336.
Determination: Fam. Paraiulidae / Parajulus Hewitti, Type Material, Cotype Material, Refer to Can. Ent., L1, 119, 1919
Comments: Specimens are in poor condition and broken into many small pieces.

trimaculatum Shelley, 1996, ***Nepalozonium***
holotype (1 male, ethyl alcohol). Male paratype in same jar.
Verbatim: NEPAL Yangri Ridge 4700-4800m 22.IV.81 Suela Nawbable N 39 / CNC627486.
Interpretive data: **NEPAL**. along Yangri Ridge, ca. 40km NNE Kathmandu [from Shelley (1996)], 28°0′56.37″N 85°34′12.06″E, 4700-4800m, 22.iv.1981, A. Smetana, N 39, CNC627486.
Determination: Polyzoniida: Hirudisomatidae: Nepalozonium trimaculatum, Shelley 2M Types, Sig. Shelley, 1995 / M Holotype / M Paratype.
Comments: Holotype, paratype and dissected components in three separate shell vials in container jar. Specimen broken into two pieces. Specimen dried out but later rehydrated using the detergent *Aerosol OT*.

C) Insecta

Blattodea

breviclasma Velez-Bravo, 2013, ***Nyctantonina***
holotype (1 male, pinned)
Verbatim: La Trinitaria Chis. MEX. 13.VIII.1969 L.A. Kelton / CNC 91550.
Interpretive data: **MEXICO**. **Chiapas**: La Trinitaria, 16°7′13″N 92°2′27″W, 13.viii.1969, L.A. Kelton, CNC91550.
Determination: Holotype / Nyctantonina breviklasma [sic] Velez, 2012.
Comments: Specimen missing most of left foreleg and most tarsomeres on both hind legs. Genitalia dissected.

Dermaptera

assamensis Sakai, 1997, ***Chaetospania***
Valid name: *Irdex nitidipennis* (de Bormans, 1894)
holotype (1 male, preparation unknown).
Verbatim: [locality data not provided on genitalia slide] / CNC 607392.
Interpretive data: **INDIA**. **Assam**: Amatulla, 26°55′47″N 92°7′18″E, 417 to 667m, 10.iii.1961, F. Schmid, Swiss Zoological Expedition, CNC607392.
Determination: Chaetospania assamensis Sakai (1997) Syntype ♂ / Holotype ♂ genitalia S. Sakai.
Comments: Locality data taken from the original description (Sakai 1997). Unique identifier added to unit tray for eventual addition to specimen. Whereabouts of the specimen body unknown, genitalia on slide in CNC. A letter

from R. Skidmore (dated 1998, in response to loan L-1999-01-11) indicates that the body of the holotype specimen was not returned by Sakai with the paratypes, however, a slide of the holotype genitalia was received. Remainder of body possibly in Sakai collection at Osaka Museum of Natural History. Almost all other paratypes (labelled as "syntypes") from the specific collecting event appear to be present except for the allotype, which is also absent and may be with Sakai collection. Genitalia dissected on slide with same Specimen ID (CNC607392).

Mecoptera

chillcotti Byers, 1971, ***Neopanorpa***
holotype (1 male, pinned)
Verbatim: NEPAL, Ktmd. Godavari, 5000′ 31 vii 1967 Can. Nepal Exped / CNC 19543.
Interpretive data: **NEPAL**. **Kathmandu**: Godavari, 27°35′50″N 85°23′10″E, 1524m, 31.vii.1967, Canadian Nepal Expedition, CNC Type No. 12991, CNC91543.
Determination: CNC. No. 12291 HOLOTYPE Neopanorpa chillcotti ♂ George W. Byers.
Comments: Left hind leg missing.

masoni Byers, 1994, ***Kalobittacus***
holotype (1 male, pinned)
Verbatim: MEX. Ver. 1100ft. Catemaco 16-18.VI W.R.M. Mason 1969 / CNC 91547.
Interpretive data: **MEXICO**. **Veracruz**: Catemaco, 18°25′17″N 95°6′47.01″W, 335m, 16-18.vi.1969, W.R.M. Mason, CNC91547.
Determination: HOLOTYPE Kalobittacus masoni George W. Byers.

reductus Carpenter, 1933, ***Boreus***
holotype (1 male, pinned: point)
Verbatim: KALSO, BC, XII-29-06 / CNC 91527.
Interpretive data: **CANADA**. **British Columbia**: Kalso, 49°54′51″N 116°54′56.01′W, on snow, 29.xii.1906, CNC91527.
Determination: HOLOTYPE Boreus reductus 3450 No. Carpenter / Holotype / BOREUS REDUCTUS Carp.
Comments: Specimen missing tarsomeres on most legs; right foreleg and left midleg are whole.

Megaloptera

magnus Contreras-Ramos, 1998, ***Corydalus***
holotype (1 male, pinned)
Verbatim: MEX., 5mi.SW El Bosque, Chis. VI-10-1969 J.M.Campbell / At Black Light / CNC 91552.
Interpretive data: **MEXICO**. **Chiapas**: El Bosque, 5mi SW, 17°0′37.87″N 92°47′31.65″W, at black light, 10.vi.1969, J.M. Campbell, CNC91552.
Determination: HOLOTYPE Corydalus magnus Contreras-Ramos.
Comments: Apex of left mandible is missing. Some tarsomeres missing on right hind leg. Genitalia dissected.

spenceri Munroe, 1953, ***Protochauliodes***
holotype (1 male, pinned)
Verbatim: Duncan B.C 28.VII.1918 W. Downes / CNC DIPTERA # 123331.
Interpretive data: **CANADA**. **British Columbia**: Duncan, 48°46′43.30″N 123°42′28.30″W, 28.vii.1918, W. Downes, CNC Type No. 6002, CNC_Diptera123331.
Determination: Protochauliodes spenceri Munr. HOLOTYPE No. 6002
Comments: Some tarsomeres missing from right foreleg. Genitalia dissected.

Neuroptera

beardi Tauber, 1969, ***Meleoma***
holotype (1 male, pinned)
Verbatim: Chir. Mts. Ariz. VI 11 1956 H.&A. Howden / Rustler's Park 8400′ Alt. / CNC 311968
Interpretive data: **USA. Arizona**: Chiricahua Mountains, Rustler Park, 31°54′12″N 109°16′48″W, 2560m, 11.vi.1956, H.&.A. Howden, CNC311968.
Determination: Meleoma beardi Tauber det. C. Tauber HOLOTYPE. / Holotype Meleoma beardi Tauber CNC No.
Comments: Antennae missing. Abdomen removed for genitalia dissection.

borealis Klimaszewski & Kevan, 1988, ***Micromus***
holotype (1 male, pinned)
Verbatim: Unalakleet, Alaska, 5.VII.61 B.S. Heming / CNC 311964.
Interpretive data: **USA. Alaska**: Unalakleet, 63°52′23.01″N 160°47′17.01″W, 5.vii.1961, B.S. Heming, CNC311964.
Determination: HOLOTYPE ♂ Micromus borealis. Klim. & Kevan des. Klimaszewski 1988 / Micromus borealis Klim. & Kevan Det: J. Klimaszewski.
Comments: Right antenna broken. Abdomen removed and slide mounted for genitalia dissection.

canadensis Klimaszewski & Kevan, 1986, ***Plesiorobius***
holotype (1 [sex unknown], fossil: amber)
Verbatim: Nr Medicine Hat Alta July 8-11 1971 J.F. Mcalpine / Can. Nat. Coll. Type No. 18446 / CAS 382.
Interpretive data: **CANADA**. **Alberta**: Grassy Lake, near Medicine Hat, 49°46′39″N 111°41′39″W, amber collected from tailings at open pit coal measure, 8-11.vii.1971, J.F. McAlpine, 1985, CNC Type No. 18446, CAS382.
Determination: NEUROPTERA BEROTHIDAE / HOLOTYPE Plesiorobius canadensis Klimaszewski CNC No. / 1985 No. 18446.
Comments: Original description notes collection of amber at tailings at open pit coal measure. Exact locality derived from discussion with R. Sanchez (Royal Tyrrell Museum of Palaeontology).

canadensis Meinander, 1972, ***Coniopteryx* (*Xeroconiopteryx*)**
holotype (1 male, pinned: point)
Verbatim: Elbow, Sask. 10 vi 1960 A.R. Brooks. / Genit Ottw Slide 14 / CNC DIPTERA # 123335.
Interpretive data: **CANADA**. **Saskatchewan**: Elbow, 51°7′10.21″N 106°35′54″W, 10.vi.1960, A.R. Brooks, CNC Type No. 12858, CNC_Diptera123335.
Determination: HOLOTYPUS Coniopteryx canadensis n. sp. ♂ det. Meinander 1971/ HOLOTYPE CNC.No.12858 Coniopteryx canadensis Meinander
Comments: Antennae missing. Abdomen removed for genitalia dissection.

carei Smith, 1932 [variety], ***Chrysopa oculata***
Valid name: *Chrysopa oculata* Say, 1839
holotype (1 female, pinned)
Verbatim: Cranbrook, B.C. 6.VI.1926 A.A. Dennys / CNC DIPTERA # 123334.
Interpretive data: **CANADA**. **British Columbia**: Cranbrook, 49°30′46.69″N 115°46′9.84″W, 6.vi.1926, A.A. Dennys, CNC Type No. 3308, CNC_Diptera123334.
Determination: HoloTYPE Chrysopa oculata var. carei 3308 No. Smith / Chrysopa oculata var carei Smith det. by RCS Type / Chrysopa oculata Say Det. P Adams / HOLOTYPE / Chrysopa oculata SAY ♀ FIDE J.A. GARLAND 1980.
Comments: Bickley (1952) noted that the "varietal names [of *Chrysopa oculata*] are no longer of any value", but did not explicitly synonymize these names. Garland (1985a) used this to conclude that the name *carei* "no longer represents a valid taxonomic category… and is unavailable". This interpretation would appear to be valid according to ICZN (1999: Art. 45.6.4), as the original description suggested that this was not a distinct taxon, but

an unavailable name of infrasubspecific rank: “The chief excuse for indicating this colorational form as a variety is to indicate that this is not a distinct species, but a striking form attained by the gradual disappearance of vertical markings.” (Smith 1932). Antennae missing.

downesi Smith, 1932, ***Chrysopa***
Valid name: *Chrysoperla carnea* (Stephens, 1836)
holotype (1 female, pinned)
Verbatim: Vernon, B.C. 15.XII.1926 W. Downes / TL: KELOWNA NEC VERNON cf. SMITH 1932. / CNC DIPTERA # 123333.
Interpretive data: **CANADA**. **British Columbia**: Vernon, 50°15′49.57″N 119°16′25.45″W, overwintered as adult under loose bark of pine trees, 15.xii.1916, W. Downes, CNC Type No. 3309, CNC_Diptera123333.
Determination: HoloTYPE Chrysopa downesi 3309 No. Smith / Chrysopa downsi [sic] Smith Det. by RCS Type / Chrysoperla carnea (Stephens) ♀ FIDE J.A. Garland 1980 / Chrysopa carnea Steph. Det. P. Adams.
Comments: Description lists type locality as Kelowna. Vernon is the accepted locality (Garland 1985a). Abdomen appears to have been glued to the body.

intacta Navás, 1912, ***Chrysopa***
Valid name: *Kymachrysa intacta* (Navás, 1912)
neotype (1 male, pinned)
Verbatim: Kazubazua, Que. 16-VIII 1927 G.S. Walley / 2880 / CNC 311969.
Interpretive data: **CANADA**. **Quebec**: Kazubazua, 45°57′5.90″N 76°1′16.71″W, 16.viii.1927, G.S. Walley, CNC Type No. 21287, CNC311969.
Determination: Chrysopa sp, near rufilabris may be new, Det. by RCSmith / Chrysopa placita Bks Det. P Adams / NEOTYPE Chrysopa intacta Navás GARLAND CNC No. 21287 / “Ceraeochrysa” intacta (Navás), in.sed. det. C.A. Tauber ’10.
Comments: Neotype designated by Garland (1985b). Tauber & Garland (2010) note “Original syntype reported to have been retained in Navás collection, probably destroyed”. Type data of lost syntype: Toronto, 1.vi.1908. Antennae missing. Abdomen removed for genitalia dissection.

intermedia Adams, 1967, ***Pimachrysa***
holotype (1 female, pinned)
Verbatim: Snow Creek 1500′ White Water, Cal. 8.III-1955 W. R. M. Mason / CNC 312077.
Interpretive data: **USA. California**: Riverside Co., Snow Creek, White Water, 33°54′1.49″N 116°40′43.32″W, 457m, 8.iii.1955, W.R.M. Mason, CNC312077.
Determination: PIMACHRYSA INTERMEDIA ADAMS HOLOTYPE ♀ Det.P.Adams.
Comments: Left antenna broken. Left hind leg and left hind wing missing. Abdomen removed for genitalia dissection.

latipalpis Meinander, 1972, ***Coniopteryx* (*Coniopteryx*)**
holotype (1 male [shares vial with 3 female paratypes], ethyl alcohol)
Verbatim: Colo. Durango, Junction Cr. Rd. 12-17.VII.1968 Mal. Tr. E.C. Becker 10000′ / ♂ genit & palpi slide 8 ♀ genitalia slide 9 / CNC 311962.
Interpretive data: **USA. Colorado**: Durango Junction Creek Road, 37°18′44.94″N 107°53′22.10″W, 3048m, 12-17.vii.1968, E.C. Becker, Malaise trap, CNC Type No. 12860, CNC311962.
Determination: HOLOTYPUS ♂ [paratypus] 3♀♀ Coniopteryx latipalpis n. sp. det. Meinander 1971/ HOLOTYPE CNC No. 12860 Coniopteryx latipalpis Meinander / PARATYPE CNC No. 12860 Coniopteryx latipalpis Meinander.
Comments: Genitalia dissected.

murreensis Tjeder, 1963, ***Chrysopa***
Valid name: *Mallada murreensis* (Tjeder, 1963)
holotype (1 male, pinned)

Verbatim: Reared in lab / C.I.B.C 22.2.60 / C.I.B.C 60-2 / 60-188 / 69.-2883 / CNC 311966.
Interpretive data: **PAKISTAN**. **Punjab**: Murree, 33°54′22″N 73°24′1″E, 22.ii.1960, reared, CNC311966.
Determination: 8478 Holotypus ♂ Chrysopa murreensis B. Tjeder.
Comments: Locality data taken from original description. Left hind wing missing. Genitalia dissected, mounted on slide, on pin. Slide mount is crystalized and difficult to see.

nigrans Carpenter, 1940, ***Hemerobius***
holotype (1 male, pinned)
Verbatim: Mt. Lolo Kamloops, B.C. 2.VI.1938 J.K. Jacob / CNC DIPTERA # 123337.
Interpretive data: **CANADA**. **British Columbia**: Mt. Lolo, Kamloops, 50°48′7″N 120°7′37″W, 2.vi.1938, J.K. Jacob, CNC Type No. 4559, CNC_Diptera123337.
Determination: Type / HOLOTYPE Hemerobius nigrans carp. No. 4559. / Hemerobius nigrans Carp. det. F.M. Carpenter.
Comments: Dissected components of abdomen in genitalia vial, remainder of specimen missing.

Notoptera

athapaska Kamp, 1979, ***Grylloblatta***
holotype (1 male, ethyl alcohol)
Verbatim: Summit Lake, mile 392, Alaska Hiway [sic], B.C. 4925′ 26.VIII.1962 RE. Leech on eastern slope Grnd temp=6°C / CNC 165656.
Interpretive data: **CANADA**. **British Columbia**: Stone Mountain Provincial Park, Summit Lake, Mt. St. Paul, mile 392, Alaska Hwy., 58°38′53.53″N 124°40′0.89″W, 1501m, on eastern slope; ground temp = 6 deg C, 26.viii.1962, R.E. Leech, CNC Type No. 16072, CNC165656.
Determination: TYPE Grylloblatta campodei[two letters, illegible] Athapaska TYPE / ♂ Type Grylloblatta campodeiformis Athapaska S.W. Kamp / HOLOTYPE CNC No. 16072.
Comments: Vial shared with 3 juveniles and 1 dissection in mini shell vial.

nahanni Kamp, 1979, ***Grylloblatta***
holotype (1 male, ethyl alcohol)
Verbatim: CassieR, B.C. Mt. McDame/ 5,400ft IX/16,17,18/69 6,000ft. Limestone Pk. / AiR temp -34°-36°F [sic] R.H. 867 ground 32°-34°C / CNC 165658.
Interpretive data: **CANADA**. **British Columbia**: Cassiar, Cassiar Mountain Range, Limestone Pk., Mt. McDame, 59°18′57″N 129°48′27″W, 1645 to 1828m, air temp -34°-36°C, ground 32°-34°C ,16-18.ix.1969, J.W. Kamp, CNC Type No. 16073, CNC165658.
Determination: TYPE Grylloblatta campodeiformis NahaNNi TYPE / Type: Grylloblatta campodeiformis NAhaNNi: J.W. Kamp / HOLOTYPE CNC No. 16073.
Comments: Description lists elevation as 1647m and collection date as 17.ix.1969.

scudderi Kamp, 1979, ***Grylloblatta***
holotype (1 male, ethyl alcohol)
Verbatim: Whistler Mt. Garibaldi Prov. Pk., B.C. 1951m 13.VII.1970 L. Bartlett / CNC 165659.
Interpretive data: **CANADA**. **British Columbia**: Garibaldi Provincial Park, Whistler Mountain, 50°03′33″N 122°57′25″W, 1951m, on snow field in cirque below glacier, air temp 5°C, 13.vii.1970, L. Bartlett, CNC Type No. 16074, CNC165659.
Determination: TYPE Grylloblatta scuddeRi TYPE / Type GRylloblatta scudeRRi [sic] J.W. Kamp 15 I 1979 / HOLOTYPE CNC No. 16074.
Comments: Habitat information taken from original description.

Odonata

fletcheri Williamson, 1923, ***Williamsonia***
holotype (1 male, pinned)
Verbatim: OTTAWA.MER.BLEUE 29.V.1922 A.W. Richardson / CNC 480671.
Interpretive data: **CANADA**. **Ontario**: Ottawa, Mer Bleue, 45°23′38.40″N 75°30′23.82″W, 29.v.1922, A.W. Richardson, CNC Type No. 555, CNC480671.
Determination: HoloTYPE Williamsonia fletcheri Williamson No. 555 / W. fletcheri Type.

michaeli Brunelle, 2000, ***Neurocordulia***
holotype (1 male, papering)
Verbatim: Adult Specimen Taxa No. 365.3 Species No. 34,010 (Imago) A number of specimens taken by Robert Harding and one male by Jacob Harding, most near water surface. Brunelle took one male and one female fountaining up high from 1.5-2.5m. Paratypes are specimen numbers 65 (other male), and females 3, 4, 13, and 66. Deposited With To be deposited with NBM under the [sic] Collector Harding R., Harding J., Brunelle, P.M. Collection Canadian National Collection of Insects Storage Envelopes (paratypes separate) Stance Flat Specimens collected Adults All 6 Male 2 Fem 4 Numbers Observed* Adults All 2 Male 2 Fem 3 30 Jun, 95 6.30.1995 Country Canada St./Pr. New Brunswick Sub S/P tt South County Charlotte County MMU Saint James Parish MapBk 84b3 °N 45.38 °W 67.35 SiteCode CNS[745] Elev.Met. 97M Canoose Stream, Highway 745, Canoose river (small) lotic (fast) boulder shoreline; ; rocky bottom, few waterplants; alders, Myrica, mixed forest shoreplants; . *Observed Numbers Codes; 1 = one, 2 = few (2-5), 3 = many (6-25), 4 = great many (>25). P.M. Brunelle, Halifax, Nova Scotia, Canada / CNC 356448.
Interpretive data: **CANADA**. **New Brunswick**: Charlotte Co., Saint James Parish, tt South, Canoose Stream, Highway 745, Canoose, 45°22′48″N 67°21′0″W, 97m, river (small) lotic (fast) boulder shoreline; rocky bottom; few waterplants; alders; *Myrica*, mixed forest shoreplants, 30.vi.1995, Harding R., Harding J. & Brunelle, P.M., CNC356448.
Determination: Order Odonata Suborder Anisoptera Family Corduliidae Neurocordulia michaeli Brunelle 2000 Holotype Male (specimen number 62) Determinor Brunelle P.M.
Comments: Head and apex of abdomen separated from body.

Orthoptera

arizonensis Scudder, 1894, ***Ceuthophilus***
lectotype (1 male, pinned)
Verbatim: Prescott Mt Distr Centr Ariz / Pseudosternite mtd. on slide, after being figured by G. Eager / CNC 311942.
Interpretive data: **USA. Arizona**: Central Arizona, Prescott Mountain District, 34°34′36″N 112°34′20″W, E. Palmer, CNC Type No. 3828, CNC311942.
Determination: T. Ceuthophilus arizonensis Scudd. Det. by Scudder, 1894 / LECTO HOLOTYPE Ceuthophilus arizonensis Scudd. No. 3828 / LECTOTYPE Ceuthophilus arizonensis Scudder / Selected by Rehn & Hebard 1912.
Comments: Left antenna missing, right antenna broken. Both hind legs missing.

brooksi Vickery, 1967, ***Xanthippus corallipes***
holotype (1 male, pinned) (Figs 4-6)
Verbatim: Reindeer Depot, Mackenzie Delta VII-7-1948 W.J. Brown / CNC 311939.
Interpretive data: **CANADA**. **Northwest Territories**: Reindeer Depot, Mackenzie Delta, 68°40′8.31″N 134°4′17.67″W, 7.vii.1948, W.J. Brown, CNC Type No. 14093, CNC311939.
Determination: HOLOTYPE Xanthippus corallipes brooksi, Vickery 14093.
Comments: Right foreleg missing tibia and tarsus and midleg missing tarsus.

brooksi Vickery, 1979, ***Melanoplus packardii***
holotype (1 male, pinned)
Verbatim: Torch River Sask. 29.8 1954 Brooks-Wallis / CNC 311926.
Interpretive data: **CANADA**. **Saskatchewan**: Torch River, 53°38′5.53″N 104°37′3.86″W, 29.viii.1954, Brooks & Wallis, Holotype CNC Type No. 16268, CNC311926.
Determination: HOLOTYPE Melanoplus packardii brooksi 1978 Vickery C.N.C.No. 16268.
Comments: Left antenna missing. Left midtibia broken.

crypticus Vickery, 1969, ***Astehelius***
Valid name: *Cibolacris crypticus* (Vickery, 1969)
holotype (1 male, pinned)
Verbatim: Nr. San Jose Beach 40mi. SW. Cd. Obregon Son. MEX. 16-23.V.61 Howden & Martin / CNC 311931.
Interpretive data: **MEXICO**. **Sonora**: Ciudad Obregón, 64.4km SW, near San Jose Beach, 27°9′12.96″N 110°13′3.36″W, 16-23.v.1961, H. Howden & J.E.H. Martin, CNC311931.
Determination: HOLOTYPE Astehelius crypticus Vickery, 1969.
Comments: Left antenna and foreleg missing.

macdunnoughi (Urquhart, 1938), ***Nemobius***
Valid name: *Eunemobius carolinus* (Scudder, 1877)
holotype (1 female, pinned)
Verbatim: Hawthorn Ont. 7-VIII 1937 F.A. Urquhart / CNC 311958.
Interpretive data: **CANADA**. **Ontario**: Hawthorn, 45°23′19.72″N 75°36′13.37″W, margin of sphagnum bog, 7.viii.1937, F.A. Urquhart, CNC Type No. 4363, CNC311958.
Determination: HOLOTYPE ♀ Nemobius macdunnoughi Urquhart No. 4363 / Nemobius macdunnoughi Urq. / Holotype.
Notes: "Hawthorne" likely refers to Hawthorne Village, a small village located outside of Ottawa from 1873 (when it first assumed the name Hawthorne) until it was annexed by Ottawa in 1950. Hawthorne was located in the area of Hawthorne and Russell Roads in present day Ottawa (information from the Gloucester Historical Society). The original description states that specimens were collected on the margin of a sphagnum bog, which likely refers to Mer Bleue, which is just to the east of Hawthorne.
Comments: Left hind leg missing.

Phthiraptera

euarctidos Hopkins, 1954, ***Trichodectes pinguis***
Valid Name: *Trichodectes euarctidos* Hopkins, 1954
holotype+allotype (2 male/female, slide)
Verbatim: Dom. Entom. Lab. Kamloops, B.C. No 1193 Loc Gray Crk B.C. 3 June 1936 Host Euarctos americanus Coll T.K. Molliet / CNC 165268.
Interpretive data: **CANADA**. **British Columbia**: Kamloops, Gray Creek, 49°37′48.69″N 116°47′3.33″W, 3.vi.1936, ex *Ursus americanus* Pallas, T.K. Molliet, CNC Type No. 21208, CNC165268.
Determination: Trichodectes pinguis euarctidos Hopkins ♂ Holotype + ♀ allotype / HOLOTYPE Trichodectes pinguis euarctidos H CNC No. 21208 / ALLOTYPE Trichodectes pinguis euarctidos H. CNC No. 21208.

gibsoni Hopkins, 1947, ***Lagopoecus***
holotype+allotype (2 male/female, slide)
Verbatim: Canadian National Collection C.R.T. Loc.: Dollard, SASK. Host: Centrocercus urophasianus Date: 10.VII.1935 Coll.: C.F. Holmes / CNC 165223.
Interpretive data: **CANADA**. **Saskatchewan**: Dollard, 49°36′51.27″N 108°35′1.23″W, 10.vii.1935, ex *Centrocercus urophasianus* (Bonaparte), C.F. Holmes, CNC Type No. 5693, CNC165223.
Determination: Can. Nat. Coll. Type no. 5693 Lagopoecus gibsoni Hopkins HOLOTYPE ALLOTYPE.

Psocoptera

canadensis Grimaldi & Engel, 2006, ***Sphaeropsocoides***
holotype (1 female, fossil: amber)
Verbatim: [No locality data] / CAS 662.
Interpretive data: **CANADA**. **Alberta**: Grassy Lake, near Medicine Hat, 49°46′39″N 111°41′39″W, v.1973, J. F. McAlpine & H. J. Teskey, CAS662.
Determination: HOLOTYPE Sphaeropscoides canadensis Grimaldi & Engel, 2006 (Pscoptera [sic]: Sphaeropsocidae) Amer. Mus. Novit. 3523.
Comments: Original description states "Holotype CNC 642". The number is actually CAS662. Exact locality from discussion with R. Sanchez (Royal Tyrrell Museum of Palaeontology). Other interpretive data from Skidmore (1999).

chillcotti New, 1971, ***Dasypsocus***
holotype (1 female, ethyl alcohol)
Verbatim: Nepal, Ktmd., Pulchauki, 6600′ 21.VII.1967 Can. Nepal Exped. / 7096/ CNC 348415.
Interpretive data: **NEPAL**. **Kathmandu**: Pulchauki, 27°58′0″N 85°0′0″E, 2011m, 21.vii.1967, Canadian Nepal Expedition, CNC Type No. 11569 - Slide No. 7096-1 / Slide No. 7096-2 / Slide No. 7096-3, CNC348415.
Determination: Dasypsocus chillcotti New 1970. HOLOTYPE ♀ / HOLOTYPE CNC No. 11569.
Comments: Dissected components of holotype divided amongst 3 slides.

enderleini New, 1971, ***Caecilius***
holotype (1 female, ethyl alcohol)
Verbatim: Nepal, Godavari, Mal. Trap #18, 5000' Aug.4-7.1967 Can. Nepal Exped. / 70104 / CNC 348413.
Interpretive data: **NEPAL**. **Kathmandu**: Godavari, 27°35′50″N 85°23′10″E, 1524m, 4-7.viii.1967, Canadian Nepal Expedition, Malaise trap, CNC Type No. 11572 - Slide No. 70104-1 / Slide No. 70104-2 / Slide No. 70104-3, CNC348413.
Determination: CAECILIUS ENDERLEINI New 1970 HOLOTYPE ♀ / HOLOTYPE CNC No. 11572.
Comments: Dissected components of holotype divided amongst 3 slides.

godavarense New, 1971, ***Trichadenotecnum***
holotype (1 female, ethyl alcohol)
Verbatim: Nepal, Ktmd., Godavari, 6000ft. 7-13.VIII.1967. Mal tr. #16 Can. Nepal Exped. / 7090 / CNC 348416.
Interpretive data: **NEPAL**. **Kathmandu**: Godavari, 27°35′50″N 85°23′10″E, 1828m, 7-13.viii.1967, Canadian Nepal Expedition, Malaise trap, CNC Type No. 11566 - Slide No. 7090-1 / Slide No. 7090-2, CNC348416.
Determination: TRICHADENOTECNUM HOLOTYPE GODAVARI [sic] New 1970 ♀ / HOLOTYPE CNC No. 11566.
Comments: Dissected components of holotype divided amongst 2 slides.

himalayanus New, 1971, ***Ectopsocus***
holotype (1 male, ethyl alcohol)
Verbatim: Nepal, Kachuhani nr. Birganj, 450ft., 4-12.IX.1967 Mal. tr. #33 Can. Nepal Exped. / 7095 / CNC 348342.
Interpretive data: **NEPAL**. Kachuhani nr. Birgunj, 137m, 4-12.ix.1967, Canadian Nepal Expedition, Malaise trap, CNC Type No. 11568, Slide No. 7095-1 / Slide No. 7095-2 / Slide No. 7095-3, CNC348342.
Determination: ECTOPSOCUS HIMALAYANUS NEW 1970 HOLOTYPE ♂ / HOLOTYPE CNC No. 11568.
Comments: Dissected components of holotype divided amongst 3 slides.

katmanduensis New, 1971, ***Pseudocaecilius***
holotype (1 female, ethyl alcohol)
Verbatim: Nepal, Godavari, Mal. Trap #19, 5000′ 1-4.VIII.1967 Can. Nepal Exped. / 70102 / CNC 348421.
Interpretive data: **NEPAL**. **Kathmandu**: Godavari, 27°35′50″N 85°23′10″E, 1524m, 1-4.viii.1967, Canadian

Nepal Expedition, Malaise trap, CNC Type No. 11567, Slide No. 70102-1 / Slide No. 70102-2 / Slide No. 70102-3, CNC348421.
Determination: PSEUDOCAECILIUS HOLOTYPE KATMANDUI [sic] New 1970 ♀ / HOLOTYPE CNC No. 11567.
Comments: Dissected components of holotype divided amongst 3 slides.

masoni New, 1971, ***Trichadenotecnum***
holotype (1 male, ethyl alcohol)
Verbatim: Nepal, Ktmd., Bhurumche 85-9500′ oak forest 30.V.1967 Can. Nepal Exped. / 7089 / CNC 348418.
Interpretive data: **NEPAL**. **Kathmandu**: Bhurumche, 2590-2743m, oak forest, 30.v.1967, Canadian Nepal Expedition, CNC Type No. 11565, Slide No. 7089-1 / Slide No. 7089-2 / Slide No. 7089-3, CNC348418.
Determination: TRICHADENTOTECNUM ♂ MASONI NEW HOLOTYPE / HOLOTYPE CNC No. 11565.
Comments: Dissected components of holotype divided amongst 3 slides.

nepalensis New, 1971, ***Psococerastis***
holotype (1 female, ethyl alcohol)
Verbatim: Nepal, Ktmd., Godavari 6000′ 23.VIII.1967 Can. Nepal Exped. / 7085 / CNC 348419.
Interpretive data: **NEPAL**. **Kathmandu**: Godavari, 27°35′50″N 85°23′10″E, 1828m, 23.viii.1967, Canadian Nepal Expedition, CNC Type No. 11564, Slide No. 7085-1 / Slide No. 7085-2 / Slide No. 7085-3, CNC348419.
Determination: PSOCOCERASTIS NEPALENSIS New 1970 ♀ HOLOTYPE / HOLOTYPE CNC No. 11564.
Comments: Dissected components of holotype divided amongst 3 slides.

nepalensis New, 1971, ***Stenopsocus***
holotype (1 female, ethyl alcohol)
Verbatim: 27°56′N.85°00′E., Mal. tr. 8, 10000ft., 23-29.V.1967 Can. Nepal Exped. / 7098 / CNC 348343.
Interpretive data: **NEPAL**. 27°56′N 85°0′E, 3048m, 23-29.v.1967, Canadian Nepal Expedition, Malaise trap, CNC Type No. 11570, Slide No. 7098-1 / Slide No. 7098-2 / Slide No. 7098-3, CNC348343.
Determination: STENOPSOCUS NEPALENSIS NEW 1970. HOLOTYPE ♀ / HOLOTYPE CNC No. 11570
Comments: Dissected components of holotype divided amongst 3 slides.

roseus New, 1971, ***Caecilius***
Valid name: *Valenzuela roseus* (New, 1971)
holotype (1 female, ethyl alcohol)
Verbatim: Nepal, nr. Birginj, Lothar, 450′, Mal. tr#34 17-19.IX.1967 Can. Nepal Exped. / 70103 / CNC 348414.
Interpretive data: **NEPAL**. nr. Birgunj, Lothar, 27°1′0″N 84°52′0″E, 137m, 17-19.ix.1967, Canadian Nepal Expedition, Malaise trap, CNC Type No. 11571 - Slide No. 70103-1 / Slide No. 70103-2 / Slide No. 70103-3, CNC348414.
Determination: CAECILIUS ROSEUS NEW 1970. HOLOTYPE ♀ / HOLOTYPE CNC No. 11571.
Comments: Dissected components of holotype divided amongst 3 slides.

Raphidioptera

americana Carpenter, 1959, ***Raphidia***
Valid name: *Alena* (*Mexicoraphidia*) *americana* (Carpenter, 1959)
holotype (1 male, ethyl alcohol)
Verbatim: 5 mi. North of Cuernavaca 6000′. Morelos, Mexico Aug 28, 1958. Beating Pine. H.F. Howden / 5 mi. North of Cuernavaca 6000′. Morelos, Mexico 28.VIII.1958. Beating pine. H.F. Howden / ALC COLL. / CNC 627587.
Interpretive data: **MEXICO**. **Morelos**: Cuernavaca, 8.1km North, 19°2′4.32″N 99°16′22.11″W, 1828m, on pine, beating, 28.viii.1958, H.F. Howden, CNC Type No. 6826, CNC627587.
Determination: H.U. Aspöck vid. 1969 / Raphidioptera Americana Carp. Holotype / TYPE No. 6826, C.N.C. /

TYPE Raphidia Americana Carpenter No. 6826/ HOLOTYPE Raphidia Americana Carpenter No. 6826.
Comments: Abdomen removed for genitalia dissection.

Siphonaptera

adversus Wagner, 1936a, ***Megabothris***
Valid name: *Megabothris abantis* (Rothschild, 1905)
holotype (1 female, slide)
Verbatim: Fr. Peromuscus mani-culatus austerus / Property of Univ. of B.C. Vancouver, B.C. Canada, 26.V.35 G.J. Spencer vial 353.5 353.5 / CNC60913.
Interpretive data: **CANADA**. **British Columbia**: Vancouver, 49°15′38.20″N 123°6′53.34″W, ex *Peromyscus maniculatus austerus* (Baird), 26.v.1935, G.J. Spencer, CNC Type No. 4550, CNC60913.
Determination: type Megabothris ♀ adversus Wagn. Wagner determ. / TYPE No. 4550.

aiyurensis Holland, 1969, ***Acanthopsylla***
Valid name: *Acanthopsylla enderleini* (Wagner, 1933)
holotype (1 male, slide)
Verbatim: Canadian National Collection No.: 58-7 Loc.: Aiyura New Guinea 6000′ Host: Eudromicia Date: 28.IX.57 Coll.: G.P. Holland / CNCI 00062898.
Interpretive data: **PAPUA NEW GUINEA**. **Eastern Highlands**: Aiyura, 6°20′16″S 145°54′14″E, 1830m, ex *Cercartetus caudata* (Milne-Edwards), 28.ix.1957, G. P. Holland, CNC Type No. 9739 / No. 58-7, CNCI62898.
Determination: Can. Nat. Coll. Type No. 9739 aiyurensis Holland HOLOTYPE ♂ head + gen.
Comments: The original description incorrectly lists the date of collection as 20.ix.1957.

arcuegens Holland, 1952, ***Ceratophyllus***
holotype (1 male, slide) (Figs 1-3)
Verbatim: Canadian National Collection No.: 51-295 Loc.: Rampart House, Y.T. Host: nest of Petrochelidon Date: IX.51 Coll.: J.E.H. Martin / Figs. metathorax seg. VII + gen. / CNCI 00062870.
Interpretive data: **CANADA**. **Yukon**: Rampart House, 67°25′26.56″N 140°59′0.68″W, ex nest of *Petrochelidon pyrrhonota* (Vieillot), ix.1951, J.E.H. Martin, CNC Type No. 6000 / 51-295, CNCI62870.
Determination: Can. Nat. Coll. Type No. 6000 Ceratophyllus arcuegens Holland HOLOTYPE ♂.

athabascae Holland, 1952, ***Malaraeus penicilliger***
Valid name: *Amalaraeus athabascae* (Holland, 1952)
holotype (1 male, slide)
Verbatim: File No. 3246 Ft. Smith, N.W.T. 29.IV.48 ex Clethrionomys g. athabascae W.F. Dom.Ent.Br. Kamloops, B.C. / CNCI 0062875.
Interpretive data: **CANADA**. **Northwest Territories**: Fort Smith, 60°0′19.88″N 111°53′5.78″W, ex *Myodes gapperi* (Vigors), 29.iv.1948, W.A. Fuller, CNC Type No. 6001 / File No. 3246, CNCI62875.
Determination: Can. Nat. Coll. Type No. 6001 Malaraeus penicilliger athabascae Holland HOLOTYPE ♂ / Amalaraeus dissimilis atha.

barretti Holland, 1969, ***Papuapsylla***
holotype (1 male, slide)
Verbatim: Canadian National Collection No.: 58-27 Loc.: Mt. Wilhelm, New Guinea 11,400′ Host: Melomys sp. Date: 13-X-57 Coll.: G.P. Holland / CNC617081 / CNC617081.
Interpretive data: **PAPUA NEW GUINEA**. Mt. Wilhelm, 5°45′39.60″S 145°4′48″E, 3474m, ex nest of *Melomys* sp., 13.x.1957, G.P. Holland, CNC Type No. 9754 / No. 58-27, CNC617081.
Determination: Can. Nat. Coll. Type no. 9754 barretti Holland HOLOTYPE ♂ Fig. gen. F. + st. IX.

calderwoodi Holland, 1979, ***Ceratophyllus***
holotype (1 male, slide)
Verbatim: Canadian National Collection S77-72 Loc.: Kouchibouguac Nat'l Park, N.B. Host: Petrochelidon pyrrhonota nest Date: 7.IX.1977 Coll.: G. Calderwood / CNCI 00062886.
Interpretive data: CANADA. New Brunswick: Kouchibouguac National Park, 46°51′0″N 64°58′12″W, ex nest of *Petrochelidon pyrrhonota* (Vieillot), 7.ix.1977, G. Calderwood, CNC Type No. 15896 / No. S77-72, CNCI62886.
Determination: Can. Nat. Coll. Type No. 15896 Ceratophyllus calderwoodi Holland HOLOTYPE ♂ Can. Ent. 111: 717 15896.

campestris Holland, 1949, ***Callistopsyllus***
Valid name: *Callistopsyllus terinus campestris* Holland, 1949
holotype (1 male, slide)
Verbatim: File No. 1827 Medicine Hat, Alberta 6.VI.40 ex Peromyscus m. osgoodi G.P. Holland Dom.Ent.Br. Kamloops, B.C. / CNCI 00062876.
Interpretive data: **CANADA**. **Alberta**: Medicine Hat, 50°2′7.02″N 110°40′34.74″W, ex *Peromyscus maniculatus* (Wagner), 6.vi.1940, G.P. Holland, CNC Type No. 5718, CNCI62876.
Determination: SIPHONAPTERA Callistopsyllus campestris Holland HOLOTYPE ♂ No. 5718 Det. Geo. P. Holland / HOLOTYPE ♂ CNC No. 5718.

columbiana Wagner, 1940, ***Nearctopsylla hygini***
Valid name: *Nearctopsylla jordani* Hubbard, 1940
holotype (1 male, slide)
Verbatim: vial: 52 Scapanus orarius schefferi Jackson U.B.C. Campus, Vancouver, B.C. 9.XII.38 G.J.S / CNCI 00001393.
Interpretive data: **CANADA**. **British Columbia**: Vancouver, University of British Columbia, campus, 49°15′38.01″N 123°14′46″W, ex *Scapanus orarius schefferi* Jackson, 9.xii.1938, G.J. Spencer, CNCI1393.
Determination: N. jordani Hubbard April 1940 Det. 16.I.1942. Geo.P.Holland / vial 52 Nearctopsylla hygini R. ♂ vancouverensis ssp. n. Jul. Wagner det. / N.B. This is the Holo-type of N. hygini columbiana W. May '40.
Comments: Smit & Wright (1965) note that the subspecific name on this holotype slide is mislabeled based on correspondence from G. Holland.

durangoensis Holland, 1965, ***Anomiopsyllus***
holotype (1 male, slide)
Verbatim: Canadian National Collection No.: S-64-100 Loc.: 3 Mi. W. Durango, Dgo., Mex. Host: Mouse nest in Yucca, Peromyscus? Date: 24.VI.1964 Coll. J.E.H. Martin / CNCI 00062906.
Interpretive data: **MEXICO**. **Durango**: Durango, 3 mi. W., 24°0′17.10″N 104°45′39.40″W, 1981m, in Yucca, ex nest of mouse (*Peromyscus*?), 24.vi.1964, J.E.H. Martin, CNC Type No. 8934 / No. S-64-100, CNCI62906.
Determination: Can. Nat. Coll. Type No. 8934 Anomiopsyllus durangoensis Holland HOLOTYPE ♂ Fig. P+F.

eudromiciae Holland, 1969, ***Acanthopsylla***
holotype (1 male, slide)
Verbatim: Canadian National Collection No.: 58-7 Loc.: Aiyura New Guinea 6000′ Host: Eudromicia Date: 28-IX-57 Coll.: G.P. Holland / CNCI 00062896.
Interpretive data: **PAPUA NEW GUINEA**. **Eastern Highlands**: Aiyura, 6°20′16″S 145°54′14″E, 1830m, ex *Cercartetus caudatus* (Milne-Edwards), 28.ix.1957, G. P. Holland, CNC Type No. 9741 / No. 58-7, CNCI62896.
Determination: Can. Nat. Coll. Type No. 9741 eudromiciae Holland HOLOTYPE ♂ head + gen.

exsecatus Wagner, 1936b [variety], ***Megarthroglossus longispinus***
Valid name: *Megarthroglossus divisus exsecatus* Wagner, 1936
holotype (1 female, slide)
Verbatim: fr. "Squirrel" Sciurus douglasii / Avola. B.C. Sept.2/32 1 Squirrel 363 / Avola, B.C 2.IX.32. (vial 363) / CNC60917.

Interpretive data: **CANADA**. **British Columbia**: Avola, 51°46′59.88″N 119°19′0.12″W, ex *Tamiasciurus douglasii* (Bachman), 2.ix.1932, CNC Type No. 4112, CNC60917.
Determination: Megarthroglossus longispinus exse-catus subsp. n. ♀ determ.: J. Wagner. / Megarthroglossus HOLOTYPE longispinus exsecatus Wagner No. 4112.

frustratus Johnson, 1957, ***Polygenis***
holotype (1 male, slide)
Verbatim: Canadian National Collection No.: 55-6 Loc.: Brasilien Nova Teutonia Date: VII-42 Coll.: F. Plaumann / CNCI 00062911.
Interpretive data: **BRAZIL**. **Santa Catarina**: Nova Teutonia, 27°11′S 52°23′W, vii.1942, host unknown, F. Plaumann, CNC Type No. 21212 / No. 55-6, CNCI62911.
Determination: CNC NO. 21212 ♂ Polygenis frustratus Johnson HOLOTYPE.

fulleri Holland, 1951, ***Catallagia dacenkoi***
Valid name: *Catallagia dacenkoi* Ioff, 1940
holotype (1 female, slide)
Verbatim: File No. 3209 Ft. Smith, N.W.T. 25.X.47 ex Clethrionomys g. athabascae W.A. Fuller Dom.Ent.Br. Kamloops, B.C. / CNCI 00062883.
Interpretive data: **CANADA**. **Northwest Territories**: Fort Smith, 60°0′19.88″N 111°53′5.78″W, ex *Myodes gapperi* (Vigors), 25.x.1947, W.A. Fuller, CNC Type No. 5720, CNCI62883.
Determination: Can. Nat. Coll. Type No. 5720 Catallagia dacenkoi fulleri Holland HOLOTYPE ♂ Can. Ent. Vol. 83 June, 1951.

globata Holland, 1971, ***Myodopsylla***
holotype (1 female, slide)
Verbatim: Canadian National Collection No.: S-69-85 Loc.: 7 mi E San Cristobal d.l.C. Chis. Mex. Host.: Bats Date: 16.V.1969 Coll. J.E.H. Martin / CNCI 00062910.
Interpretive data: **MEXICO**. **Chiapas**: 7 mi E of San Cristóbal de las Casas, 16°43′51.50″N 92°31′54.70″W, 2133m, in felled hollow tree, ex bats (*Myotis velifer* (Allen) or *Tadarida brasiliensis intermedia* Shamel), 16.v.1969, J.E.H. Martin, CNC Type No. 11551 / No. S-69-85, CNCI62910.
Determination: Can. Nat. Coll. Type No. 11551 Myodopsylla globata Holland HOLOTYPE.

grahami Holland, 1979, ***Nearctopsylla***
holotype (1 male, slide)
Verbatim: Can. Nat. Collection No: S78.11 Loc: Spruce Riv. Rd., Mi. 64, Thunder Bay Dist., Ont. Host: Martes a. americana Date: 20.XII.77 Coll: Bob Graham / CNCI 00062891.
Interpretive data: **CANADA**. **Ontario**: Thunder Bay District, Spruce River Road, mi 64, ca. 49°29′N 88°85′W, ex *Martes americana americana* (Turton), 20.xii.1977, R. Graham, CNC Type No. 15894 / No. S78.11, CNCI62891.
Determination: Can. Nat. Coll. Type No. 15894 Nearctopsylla grahami Holland HOLOTYPE ♂ Can. Ent. 111: 713.

gregsoni Holland, 1950, ***Megabothris calcarifer***
Valid name: *Megabothris calcarifer* (Wagner, 1913)
holotype (1 male, slide)
Verbatim: File No. 3276 Naknek, Alaska 28.VI.48 ex Microtus sp. J.D. Gregson Dom.Ent.Br. Kamloops, B.C. / CNCI 00062869.
Interpretive data: **U.S.A. Alaska**: Naknek, 58°43′44″N 157°0′52″W, ex *Microtus* sp., 28.vi.1948, J.D. Gregson, CNC Type No. 5872, CNCI62869.
Determination: Can. Nat. Coll. Type No. 5872 Megabothris calcarifer gregsoni Holland HOLOTYPE ♂ Can. Ent. 82: 132-133, figs. 7, 8.June.1950.

jellisoni Holland, 1954, ***Catallagia***
holotype (1 male, slide)
Verbatim: Canadian National Collection No.: 53-815 Loc.: Bow Pass, Alta. Host Clethrionomys Date: 10.X.53 Coll. G.P. Holland / CNCI 00062867.
Interpretive data: **CANADA**. **Alberta**: Peyto Lake Trail, just below vantage point at Bow Summit, Banff National Park, 105 km N Banff, 51°43′0.92″N 116°30′23.02″W, 1981-2133m, ex *Myodes gapperi* (Vigors), 10.x.1953, G.P. Holland & O. Peck, CNC Type No. 6131 / No. 53-815, CNCI62867.
Determination: Can. Nat. Coll. Type No. 6131 Catallagia jellisoni Holland HOLOTYPE ♂ Can. Ent.

lari Holland, 1951, ***Ceratophyllus***
holotype (1 male, slide)
Verbatim: Loc. Great Slave Lake Date 23.VI.1947 N.W.T. ex Larus sp. 49-46 J.R. Vockeroth / CNCI 00062865.
Interpretive data: **CANADA**. **Northwest Territories**: Whaleback Island, Great Slave Lake, 61°55′20.99″N 113°18′33.40″W, ex nest of *Larus* sp. (either *Larus californicus* Lawrence or *L. smithsonianus* Coues), 23.vi.1947, J.R. Vockeroth, CNC Type No. 5952 / 49-46, CNCI62865.
Determination: Can. Nat. Coll. Type No. 5952 Ceratophyllus lari Holland HOLOTYPE ♂ Can. Ent. 83: 282-285. 1951.

linsdalei Holland, 1957, ***Hystrichopsylla***
Valid name: *Hystrichopsylla occidentalis linsdalei* Holland, 1957
holotype (1 male, slide)
Verbatim: Ex: Microtus nest Berkeley Hills Alameda Co., Calif. 23 Mar 54 Coll: Tipton, Mendez, Loshbaugh / CNCI 00062884.
Interpretive data: **USA. California**: Alameda Co., Berkeley Hills, 37°53′32.34″N 122°16′5.61″W, ex nest of *Microtus* sp., 23.iii.1954, V.J. Tipton, E. Méndez & G. Loshbaugh, CNC Type No. 6548, CNCI62884.
Determination: Can. Nat. Coll. Type No. 6548 Hystrichopsylla linsdalei HOLOTYPE ♂ Fig. 21 Holland1957.

luluai Holland, 1969, ***Papuapsylla***
holotype (1 male, slide)
Verbatim: Canadian National Collection No.: 58-25 Loc.: Komia near Mendi, New Guinea 7200′ Host: Rattus sp. Date: 7-X-57 Coll. G.P. Holland / CNC617082 / CNC617082.
Interpretive data: **PAPUA NEW GUINEA**. **Southern Highlands**: Komia, near Mendi, 6°7′0″S 143°26′0″E, 2194m, ex *Rattus* sp., 7.x.1957, G.P. Holland, CNC Type No. 9753 / No. 58-25, CNC617082.
Determination: Can. Nat. Coll. Type No. 9753 luluai Holland HOLOTYPE ♂ Clasper + st. IX 9573.

markworthi Hubbard, 1949, ***Peromyscopsylla hamifer***
Valid name: *Peromyscopsylla h. hamifer* (Rothschild, 1906)
holotype (1 male, slide)
Verbatim: from Microtus pennsylvanicus / Flea ♂ from Meadow Mouse Smoky Falls near Kapuskasing, Ont. Nov.7.'38 - R. Whelan C.A. Hubbard / HOST Microtus pennsylvanicus / Smoky Falls (near Kapus kasing) Ontario 7-xi-1938 R.V. Whelan R.O.M.Z. / CNCI 00062890.
Interpretive data: **CANADA**. **Ontario**: Smoky Falls, near Kapuskasing, 50°3′39.54″N 82°9′58.91″W, ex *Microtus pennsylvanicus* (Ord), 7.xi.1938, R. Whelan, CNC Type No. 21246, CNCI62890.
Determination: Peromyscopsylla hamifer markworthi Hubbard 1948 Holotype ♂ / HOLOTYPE 21246 CNC No.
Comments: The original description notes deposition of this species in the Royal Ontario Museum, but its position in the CNC type catalogue indicates a subsequent transfer of ownership in the late 1980's.

martini Holland, 1965, ***Anomiopsyllus***
holotype (1 male, slide)
Verbatim: Canadian National Collection No.: S-64-96 Loc.: 10 Mi. W. El Salto Dur, Mex. Host.: Nest S. aberti in hollow tree Date: 21.VI.1964 Coll.: J.E.H. Martin / CNCI 00062889.
Interpretive data: **MEXICO**. **Durango**: El Salto, 10 mi. W., 20°31′4.18″N 103°10′57.67″W, 2743m, in hollow

tree, ex nest of *Sciurus aberti* Woodhouse, 21.vi.1964, J.E.H. Martin, CNC Type No. 8932 / No. S-64-96, CNCI62889.
Determination: Can. Nat. Coll. Type No. 8932 Anomiopsyllus martini Holland HOLOTYPE ♂ Fig. P+F.

martini Holland, 1971, ***Kohlsia***
holotype (1 male, slide)
Verbatim: Canadian National Collection No. S-69-78 Loc. km.145 Oax. hwy, 175 N. Oaxaco Mex. 4000 Host.: Oryzomys sp. Date: 22.V.1969 Coll. J.E.H. Martin / CNCI 00062903.
Interpretive data: **MEXICO**. **Oaxaca**: km 145 on Oaxaca Highway 175, ca. 18°00′N 95°58′W, 1219m, ex *Oryzomys* sp., 22.v.1969, J.E.H. Martin, CNC Type No. 11552 / No. S-69-78, CNCI62903.
Determination: Can. Nat. Coll. Type No. 11552 Kohlsia martini Holland HOLOTYPE ♂ Head, M,P.

mexicanus Holland, 1965, ***Anomiopsyllus hiemalis***
Valid name: *Anomiopsyllus nudatus mexicanus* Holland, 1965
holotype (1 male, slide)
Verbatim: Canadian National Collection No.: S-64-102 Loc.: Mesa del Huracan Chi., Mex. Host.: Neotoma nest Date: 21-25.VII.1964 Coll.: J.E.H. Martin / CNCI 00062863.
Interpretive data: **MEXICO**. **Chihuahua**: Mesa del Huracán, 29°40′6″N 108°15′11.01″W, ex nest of *Neotoma* sp., 21-25.vii.1964, J.E.H. Martin, CNC Type No. 8933 / No. S-64-102, CNCI62863.
Determination: Can. Nat. Coll. Type No. 8933 Anomiopsyllus hiemalis mexicanus Holland HOLOTYPE ♂.

neotomae Holland, 1957, ***Hystrichopsylla***
holotype+allotype (2 male/female, slide)
Verbatim: E.M. Ex: Neotoma Nest Loc: Strawberry Canyon, Berkeley, California Date: XII-23-1952 Coll: R. Lee & V.J. Tipton / CNCI 00062895.
Interpretive data: **U.S.A. California**: Alameda Co., Strawberry Canyon, 37°52′20.74″N 122°14′42.89″W, ex nest of *Neotoma* sp., 23.xii.1952, R. Lee & V.J. Tipton, CNC Type No. 6546, CNCI62895.
Determination: Can. Nat. Coll. Type No. 6546 Hystrichopsylla dippiei neotomae HOLOTYPE ♂ ALLOTYPE ♀ Holland 1957.
Comments: The description lists a different date and collectors for the holotype and allotype (February 26, 1954, E. Méndez & G. Loshbaugh). Three female paratypes are noted as having the same data as presented on the actual label transcribed here; two are present in the Spencer Entomological Collection at the University of British Columbia. The status of these types requires clarification.

occidentalis Holland, 1949, ***Hystrichopsylla***
holotype (1 male, slide)
Verbatim: File No. 3052 Mt. Seymour, Northlands, B.C. 14.VI.47 ex Clethrionomys gapperi ssp Dom.Ent.Br. Kamloops, B.C. G.P. Holland / CNCI 00062908.
Interpretive data: **CANADA**. **British Columbia**: Mt. Seymour, near Northlands, Burrard Inlet, 49°23′40″N 122°56′39″W, 1036m, ex *Myodes gapperi* (Vigors), 14.vi.1947, G.P. Holland, CNC Type No. 5716 / File No. 3052, CNCI62908.
Determination: Can. Nat. Coll. Type No. 5716 Hystrichopsylla occidentalis Holland HOLOTYPE ♂ 1949.

pacifica Holland, 1949, ***Peromyscopsylla hesperomys***
holotype (1 male, slide)
Verbatim: U.B.C. Campus, Vancouver, B.C. 3.X.43 ex Peromyscus m. austerus Dom.Ent.Br. Kamloops, B.C. / CNCI 00062862.
Interpretive data: **CANADA**. **British Columbia**: Vancouver, University of British Columbia campus, 49°15′38″N 123°14′46″W, ex *Peromyscus maniculatus* (Wagner), 3.x.1943, H.D. Fisher, CNC Type No. 5719, CNCI62862.
Determination: SIPHONAPTERA Peromyscopsylla Sp hesperomys pacifica Holland HOLOTYPE ♂ No. 5719 Det. Geo. P. Holland / HoloTYPE ♂ CNC No. 5719.

paraterinus Wagner, 1940, ***Callistopsyllus***
Valid name: *Callistopsyllus t. terinus* (Rothschild, 1905)
holotype (1 male, slide)
Verbatim: Vial N57 / Vial N57 Peromyscus maniculatus (prob.) artemisiae (Rhoads) N.F. Eagle River, B.C. Coll: E.R.B. 28.V.34 G.J.S / CNC60918.
Interpretive data: **CANADA**. **British Columbia**: North Fork of Perry River, ca. 50°95′N 119°69′W, ex *Peromyscus maniculatus* (Wagner), 28.v.1934, E.R. Buckell, CNC Type No. 21217, CNC60918.
Determination: TYPE Callistopsyllus paraterinus Wagn (=?terinus Roths.) Jul. Wagner det. / HOLOTYPE 21217 CNC No.
Comments: The description incorrectly lists the date of collection as the 24th, and notes the original depository of this specimen as being the University of Vancouver; the position of the type in the CNC type catalogue suggests that it was deposited in the CNC at or prior to the mid 1980's.

petrochelidoni Wagner, 1936a, ***Ceratophyllus***
holotype (1 male, slide)
Verbatim: fr. Petrochelidon lunifr. lunifrons / 25 Kamloops, B.C. Canada, July 34 G.J. Spencer vial: AOU 612.2 A.O.U. 612.2 / CNC60911.
Interpretive data: **CANADA**. **British Columbia**: Kamloops, 50°40′25.33″N 120°19′37.07″W, ex *Petrochelidon pyrrhonota* (Vieillot), vii.1934, G.J. Spencer, CNC Type No. 4551, CNC60911.
Determination: holotype Ceratophyllus ♂ petrochelidoni Wagn. determ. J Wagner / HOLOTYPE ♂ No. 4551.
Comments: When Wagner (1936) published this species description, he intended for the male to be designated as the holotype, but provided the collection data for the female allotype (BC: Chilcotin, 10.viii.1930). Smit & Wright (1965) further note that paratype slides in the Wagner collection, Hamburg, were initially provided with the same Kamloops collection data as the holotype above, but these data were crossed off and changed by Wagner to match the Chilcotin allotype data.

pygmaeus Wagner, 1936b, ***Megarthroglossus***
Valid name: *Megarthroglossus spenceri* Wagner, 1936
holotype (1 male, slide)
Verbatim: fr. Neotoma cine-rea occidentalis / Nicola, B.C. 25.VIII.32 (vial 351) / CNC60916.
Interpretive data: **CANADA**. **British Columbia**: Nicola, 50°09′48.65″N 120°40′13.58″W, ex *Neotoma cinerea* (Ord), 25.viii.1932, collector unknown (possibly E. Hearle), CNC Type No. 4113, CNC60916.
Determination: Megarthroglossus pygmaeus sp. n. ♂ determ.: J. Wagner / Megarthroglossus HOLOTYPE pygmaeus Wagner No. 4113.

rauschi Holland, 1960, ***Ceratophyllus***
holotype (1 male, slide)
Verbatim: Canadian National Collection No.: 59-224 Loc.: 30 mi. N. Stewart R. Crossing, Yukon Host.: ex nest of flicker Date: 16-VIII-1959 Coll. Holland Martin / CNCI 00062904.
Interpretive data: **CANADA**. **Yukon**: Stewart River Crossing on Alaska Highway, 30 mi. N., ex nest of *Colaptes* sp., 16.viii.1959, G.P. Holland & J.E.H. Martin, CNC Type No. 7154 / No. 59-224, CNCI62904.
Determination: Can. Nat. Coll Type No. 7154 Ceratophyllus rauschi Holland HOLOTYPE ♂.
Comments: The locality may refer not to the Alaska Highway (provided in the original description), but to the Klondike Highway, which reaches Stewart Crossing at Silver Trail; if so, the collection locality would be ca. 63°36′14.8″N 137°30′31.0″W.

rauschi Holland, 1979, ***Rhadinopsylla***
holotype (1 male, slide)
Verbatim: Can. Nat. Collection No.: S77-39 Loc.: Cypress Lake, S. of Cypress Hills, Sask. Host: Peromyscus maniculatus Date: 24-26.V.76 Coll.: R.L.R / CNCI 00062861.
Interpretive data: **CANADA**. **Saskatchewan**: Cypress Lake, S of Cypress Hills, 49°28′44.03″N 109°23′38.84″W, ex *Peromyscus maniculatus* (Wagner), 24-26.x.1976, R.L. Rausch, CNC Type No. 15895 / No. S77-39,

CNCI62861.
Determination: Can. Nat. Coll. Type No. 15895 Rhadinopsylla (M.) rauschi Holland HOLOTYPE ♂ Can. Ent. 111: 716.

scapani Wagner, 1936a, ***Neopsylla***
Valid name: *Epitedia scapani* (Wagner, 1936a)
holotype (1 male, slide)
Verbatim: fr. Scapanus orarius orarius / Vancouver, B.C Canada, IV.1933 G.J. Spencer vial 14.1 / CNC60914.
Interpretive data: **CANADA**. **British Columbia**: Vancouver, 49°15′38.20″N 123°06′53.34″W, ex *Scapanus orarius* True, iv.1933, G.J. Spencer, CNC Type No. 4552, CNC60914.
Determination: holotype Neopsylla ♂ scapani Wagn. Wagner determ. / HOLOTYPE ♂ No. 4552

scopulorum Holland, 1952, ***Ceratophyllus***
holotype (1 male, slide)
Verbatim: Canadian National Collection No.: 51-295 Loc.: Rampart House, Y.T. Host: nest of Petrochelidon Date: 10.VIII.51 Col'.: J.E.H. Martin / CNCI 00062872.
Interpretive data: **CANADA**. **Yukon**: Rampart House, 67°25′26.56″N 140°59′0.68″W, ex nest of *Petrochelidon pyrrhonota* (Vieillot), 10.viii.1951, J.E.H. Martin, CNC Type No. 5999 / No. 51-295, CNCI62872.
Determination: Can. Nat. Coll. Type No. 5999 Ceratophyllus scopulorum Holland HOLOTYPE ♂.
Comments: Incorrect collection data are provided in Lewis *et al.* (1993) for this specimen in part.

septentrionalis Stewart & Holland, 1940, ***Aetheopsylla***
Valid name: *Oropsylla arctomys* (Baker, 1904)
holotype (1 female, slide)
Verbatim: File No. 1505-a. Wigwam Mine, B.C. (south of Revelstoke), 21.May.1939 ex Marmota monax petrensis Howell coll. E.R.Buckell Dom.Ent.Br. Kamloops, B.C. / CNCI 00062885.
Interpretive data: **CANADA**. **British Columbia**: Wigwam Mine (about 22 km south of Revelstoke), 50°52′48″N 117°58′04″W, ex *Marmota monax canadensis* (Erxleben), 21.v.1939, E.R. Buckell, CNC Type No. 4986 / File No. 1505-a, CNCI62885.
Determination: Aetheopsylla septentrionalis Stewart + Holland 1939 HOLOTYPE ♀ C.N.C. #4986 / =Oropsylla arctomys (Baker) G.P.H. / HOLOTYPE 4986 No.

sinuatus Holland, 1965, ***Anomiopsyllus***
holotype (1 male, slide)
Verbatim: Canadian National Collection No.: 61-111 Loc.: 30 mi. W. Durango Dur. Mex. 8000 Host.: Peromyscus nest Date: 5-VI-1961 Coll. J.E.H. Martin / CNCI 00062900.
Interpretive data: **MEXICO**. **Durango**: Durango, 30 mi. W., 23°53′27.10″N 105°07′21.66″W, 2438m, ex nest of *Peromyscus* sp., 5.vi.1961, J.E.H. Martin, CNC Type No. 8935 / No. 61-111, CNCI62900.
Determination: Can. Nat. Coll. Type No. 8935 Anomiopsyllus sinuatus Holland HOLOTYPE ♂.
Comments: Description notes elevation as being 6500ft.

spenceri Wagner, 1936b, ***Megarthroglossus***
holotype (1 female, slide)
Verbatim: Nicola, Br. C. Canada 26.VIII.1932 E.H.N 352 vial N49 / fr. Ochotona princeps unisex? / CNC60915.
Interpretive data: **CANADA**. **British Columbia**: Nicola, 50°09′49.10″N 120°40′13.93″W, ex *Ochotona princeps* (Richardson), 26.viii.1932, E. Hearle, CNC Type No. 21248 / E.H.N 352, CNC60915.
Determination: M. spenceri Holotype / Megarthroglossus spenceri sp. ♀ determ. J. Wagner / HOLOTYPE 21248 CNC. No.
Comments: The holotype originally belonged to G.J. Spencer's collection.

spenceri Wagner, 1936a, ***Thrassis***
holotype (1 male, slide)

Verbatim: from Hoary marmot (Alpine) Marmota sp. / (Vial 67) Birch Island, B.C (7000′) 12.VIII.31. / 193 Eric Hearle / CNC60909.
Interpretive data: **CANADA**. **British Columbia**: Granite Mountain, near Birch Island, 51°30′09.72″N 119°55′59.16″W, 2133m, ex *Marmota caligata okanagana* (King), 12.viii.1931, E. Hearle, CNC Type No. 4111, CNC60909.
Determination: typus Thrassis spenceri sp. n. ♂ det: J. Wagner / HOLOTYPE Thrassis spenceri No. 4111.
Comments: Species originally described in Wagner (1936a, published 25.vi.1936), and later described again as a new species (actually a junior synonym) in Wagner (1936b, published ix.1936). The specimens originally belonged to G.J. Spencer's collection.

spinata Holland, 1949, ***Hystrichopsylla***
Valid name: *Hystrichopsylla dippiei spinata* Holland, 1949
holotype (1 male, slide)
Verbatim: Vancouver, B.C. 16.x.36 ex Spilogale g. olympica G.P.H Dom.Ent.Br. Kamloops, B.C. / CNCI 00062860.
Interpretive data: **CANADA**. **British Columbia**: Vancouver, University of British Columbia campus, 49°15′38″N 123°14′46″W, ex *Spilogale gracilis latifrons* Merriam, 16.x.1936, G.P. Holland, CNC Type No. 5717, CNCI62860.
Determination: Can. Nat. Coll. Type No. 5717 Hystrichopsylla spinata Holland HOLOTYPE ♂ 1949.

truncata Holland, 1957, ***Hystrichopsylla dippiei***
holotype (1 male, slide)
Verbatim: C.N.C. Okanagan Ldg., B.C. 15.IX.50 ex Peromyscus m. artemisiae J.D. Gregson / CNCI 00062893.
Interpretive data: **CANADA**. **British Columbia**: Okanagan Landing, 50°13′59.52″N 119°21′04.32″W, ex *Peromyscus maniculatus* (Wagner), 15.ix.1950, J.D. Gregson, CNC Type No. 6547, CNCI62893.
Determination: Can. Nat. Coll. Type No. 6547 Hystrichopsylla dippiei truncata HOLOTYPE ♂ Holland, 1957.

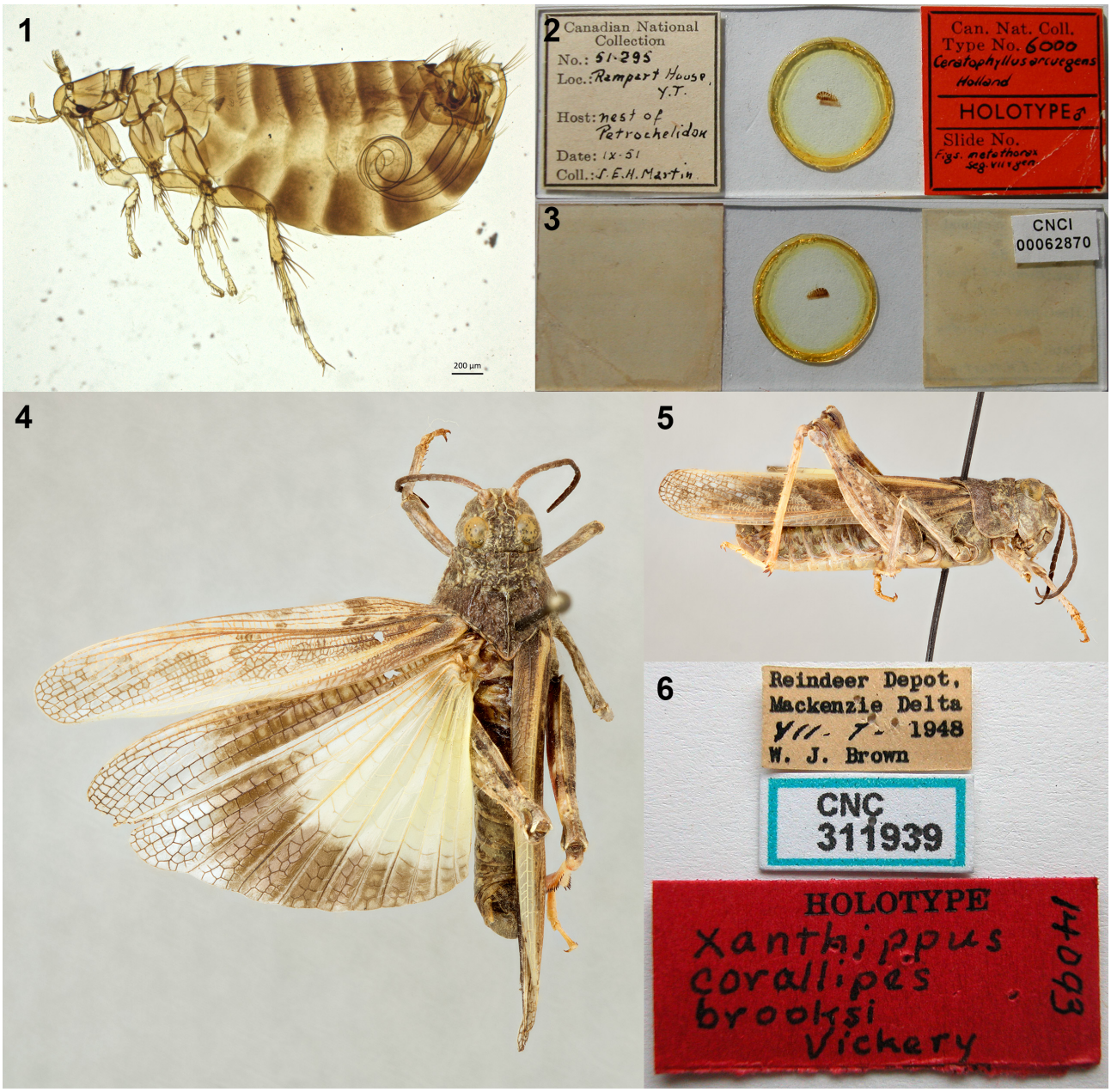
tundrensis Holland, 1944, ***Ceratophyllus***
Valid name: *Rosickyiana lunata* (Jordan & Rothschild, 1920)
holotype (1 male, slide)
Verbatim: Host: Arctic weasel Mustela arctica Aug. 27, 1937 Baker Lake N.W.T. Dom.Ent.Br. Ottawa / CNCI 00062879.
Interpretive data: **CANADA**. **Nunavut**: Baker Lake, 64°19′07.21″N 96°01′20.06″W, ex *Mustela erminea arctica* Merriam, 27.viii.1937, C.H.D. Clarke, CNC Type No. 5544, CNCI62879.
Determination: Can. Nat. Coll. Type No. 5544 Ceratophyllus tundrensis Holland HOLOTYPE ♂ Can. Ent., Dec. 1944.

vancouverensis Stark, 1957, ***Thrassis spenceri***
Valid name: *Thrassis s. spenceri* Wagner,1936
holotype (1 male, slide)
Verbatim: File No. 2371 Mt. Washington Vancouver Isld B.C. 30.VIII.43 ex Marmot Dom.Ent.Br. Kamloops, B.C. G.C.C / CNCI 00062881.
Interpretive data: **CANADA**. **British Columbia**: Mt. Washington, Vancouver Island, 49°45′13″N 125°17′49″W, ex *Marmota vancouverensis* Swarth, 30.viii.1943, G.C. Carl, CNC Type No. 21247 / No. 2371, CNCI62881.
Determination: Thrassis ♂ vancouverensis Stark 1957 HOLOTYPE PLAGUE LABORATORY COMMUNICABLE DISEASE CENTER, SAN FRANCISCO, CAL / HOLOTYPE 21247 CNC No.

vancouverensis Wagner, 1936a, ***Nycteridopsylla***
lectotype (1 male, slide)
Verbatim: Lab. No. 56.2. Vancouver. B.C. 25.XI.35 Ex. Lasionycteris noctivagans Loc. G.J. Spencer Div. Ent. Ottawa / CNCI 00000798.
Interpretive data: **CANADA**. **British Columbia**: Vancouver, 49°15′38.20″N 123°06′53.34″W, 25.xi.1935, ex *Lasionycteris noctivagans* (LeConte), G.J. Spencer, CNCI798.

Determination: 56.2 Nycteridopsylla vancouverensis Wagner ♂ LECTOTYPE des. Smit + Wright '65 [OL writing].

Comments: Four males and four females collected on two different dates are listed in the type series. Three specimens, one male and two females, are now located in the CNC; three of the remaining specimens were listed by Smit & Wright (1965) as being in the University of British Columbia and the J. Wagner collection in the Zoologisches Museum, Hamburg, Germany. While Wagner noted that there was a singular "Typus" among the eight specimens he examined, he did not specify which one it was, and the slides were not labeled so as to allow for type identification. As such, these specimens were treated by Smit & Wright (1965) as syntypes (see ICZN (1999: Art. 73.2.1)), who designated the sole male in the CNC as the lectotype.



FIGURES 1–6. Figs 1–3. Holotype *Ceratophyllus arcuegens* Holland, 1952 (1) lateral (2) front of slide (3) back of slide images. **Figs 4–6.** Holotype *Xanthippus corallipes brooksi* Vickery, 1967 (4) dorsal (5) lateral (6) label images.

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