



## A new invasive *Ptinella* Motschulsky from Europe and North America (Coleoptera: Ptiliidae)

OSCAR VORST

Netherlands Centre for Biodiversity Naturalis, PO Box 9517, 2300 RA Leiden, The Netherlands. E-mail: oscar.vorst@ncbnaturalis.nl

### Abstract

*Ptinella populicola* sp. n. is described from material recently collected in the Netherlands. The habitus, spermatheca and aedeagus are illustrated. The only earlier specimens known are from Maryland (USA). The species is considered introduced into Europe, possibly being of Nearctic origin.

**Key words:** Coleoptera, Ptiliidae, *Ptinella*, new species, invasive species, Europe, North America

### Introduction

The ptiliid genus *Ptinella* Motschulsky, 1844 consists of tiny (0.5–1.3 mm long), relatively flat, pubescent, yellow to brown beetles. The globally distributed genus currently contains about 50 valid species (Brinck 1948; Csiki 1911; Johnson 1972, 1975a, 1975b, 1982a, 1982b, 1985, 1993, 2004), with 14 species known to occur in the Palaearctic region (Johnson 2004). Remarkably rich is the New Zealand fauna with 19 species, 15 of which have been described in recent decades (Johnson 1982a). The Seychelles and neighbouring islands harbour seven species (Johnson 1985). From the Nearctic region six described species are currently recorded (Hall 2001; Sörensson 2003). The present knowledge of ptiliid diversity should be considered limited and the number of undescribed species of these minute beetles might be considerable, especially outside of Europe.

The taxonomy within the genus is in large part based on the female spermatheca, which usually is highly characteristic. Dimorphism is common within *Ptinella*, where a flightless, de-pigmented, and blind or small-eyed form usually is dominant: *forma aptera*. Normal winged individuals, belonging to the *forma alata*, are more heavily pigmented and in the possession of normal eyes. Both forms are capable of reproduction (Dybas 1978; Taylor 1981). Some species are known to be parthenogenetic (Dybas 1966; Taylor 1981). *Ptinella* species live under humid conditions and are usually associated with dead trees, decaying wood, leaf litter, or other decaying vegetable matter (Horion 1949; Johnson 1982a).

Recently, a species of *Ptinella* was discovered at two localities in the Netherlands. It differs from the known northwest European species, both externally and in the shape of the spermatheca. In the course of establishing its identity, conspecific material was discovered from Maryland (USA), indicating a possible Nearctic origin. Hall (2001) reports the presence of 'three species and many more undescribed' *Ptinella* for North America north of Mexico. These are *Ptinella pini* (LeConte, 1863), *P. quercus* (LeConte, 1863), and *P. ochracea* (Casey, 1924). Syntypic material of the former two, described by LeConte (1863) in *Ptilium* Gyllenhal, as well as *Ptilium nigrovittis* LeConte, 1863, considered a synonym of *Ptilium quercus*, was studied, but proved to be different from the new species which is larger and has a broader body shape and a duller pronotal surface.

Recently three more species, described from the Palaearctic region, have been reported from North America (Sörensson 2003): *Ptinella aptera* (Guérin-Méneville, 1839), *P. britannica* Matthews, 1858 and *P. johnsoni* Rütanen, 1985.

Measurements were taken from card-mounted specimens using an ocular micrometer.

Depositories

cOV	Collection O. Vorst, Utrecht, The Netherlands
MCZ	Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA (P.D. Perkins)
RMNH	National Museum of Natural History, Naturalis, Leiden, The Netherlands (A. van Assen)
USNM	National Museum of Natural History, Smithsonian Institution, Washington, DC, USA (G.F. Hevel)

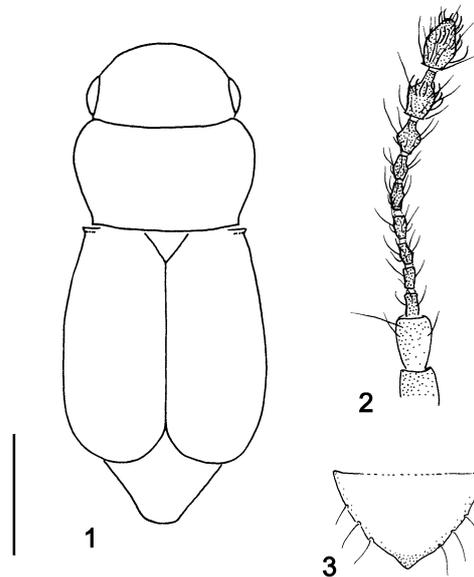
*Ptinella populicola* Vorst, new species

(Figs. 1–6)

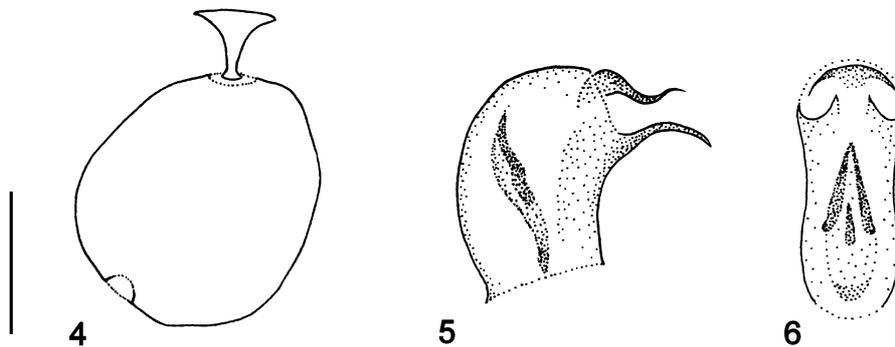
**Diagnosis.** A relatively large and broad *Ptinella* (Fig. 1), dorsum dull, spermatheca as in Fig. 4. Dimorphic.

**Description. *Forma alata.*** Body rather broad, yellowish brown to brown, antennae and legs yellowish. Length (front of head to elytral apex): 0.62–0.70 mm (median 0.68 mm, N = 16).

Head strongly reticulate, dull. Eyes well developed. Head width: 0.24–0.27 mm (median 0.25 mm, N = 16). Antennae (Fig. 2) rather long: 0.35–0.38 mm (median 0.37 mm, N = 7).



**FIGURE 1–3.** *Ptinella populicola*, habitus female *forma alata* (1), antenna (2) and male pygidium (3). Scale bar 0.2 mm (1) or 0.1 mm (2, 3).



**FIGURE 4–6.** *Ptinella populicola*, spermatheca (4) and aedeagus in lateral (5) and dorsal (6) view. Scale bar 0.05 mm.

Pronotum 1.55–1.75 × as broad as long, widest before middle. Pronotal length: 0.18–0.20 mm (median 0.19 mm, N = 16), pronotal width: 0.28–0.32 mm (median 0.30 mm, N = 16). Frontal margin slightly emarginate, longer than hind margin. Fore angles bluntly protruding. Sides finely beaded, strongly curved, and sinuate before hind angles, which are clearly rectangular. Surface strongly reticulate, dull, as on head.

Elytra 1.8–2.0 × as long as pronotum. Elytral length: 0.35–0.38 mm (median 0.35 mm, N = 13). Widest at about middle. Basal margin somewhat longer than hind margin of pronotum. Shoulders clearly denticulate. Surface reticulate with meshes larger and less pronounced than on head and pronotum, clearly granulate, somewhat more shining than head and pronotum. Epipleural carina distinct basally, hardly visible from above.

Female: spermatheca characteristic (Fig. 4). Pygidium with apical tooth.

Male of *forma alata* is unknown.

**Forma aptera.** Similar to *forma alata*, but differing in the following aspects. Body yellowish brown, smaller: length (front of head to elytral apex): 0.58–0.62 mm (N = 3).

Eyes weakly developed with only about 10 ommatidia. Head width: 0.21–0.23 mm (N = 3). Antennal length: 0.33–0.35 mm (N = 3).

Pronotal length: 0.16–0.17 mm (N = 3), pronotal width: 0.27–0.28 mm (N = 3).

Elytral length: 0.30–0.33 mm (N = 3). Widest at about middle. Basal margin somewhat longer than hind margin of pronotum. Pygidium with apical tooth (Fig. 3).

Male: aedeagus as in Figs. 5–6.

Female of the *forma aptera* is unknown.

**Type material. Holotype:** ♀ *forma alata*, "Liempde, Vleeschbroek / 154.9-396.8 V4456M / 28.vii.2010 / leg. O. Vorst / Schors Populus" (RMNH), collected near Liempde (The Netherlands, Province of Noord-Brabant). Card-mounted, dissected, spermatheca and abdominal segments mounted in PVP (Lompe 1989) on the same card.

**Paratypes: THE NETHERLANDS: Province of Noord-Brabant:** ♂ (*forma aptera*) 14 ♀♀ (*forma alata*), Biesbosch, De Gijster, 25.viii.2010, under fermenting bark of standing dead poplar (*Populus* sp.), O. Vorst (cOV, MCZ, RMNH, USNM); 2 ♂♂ (*forma aptera*) 3 ♀♀ (*forma alata*), Liempde, Vleeschbroek, 28.vii.2010, under loose bark of wind-felled poplar (*Populus* sp.), O. Vorst (cOV, RMNH). **Other material: USA: Maryland:** ♀ 3 spec. (*forma alata*), Plummers I[sland], 12.xi.1911, Schwarz & Barber (USNM); 2 spec. (*forma alata*), Plummers I[sland], 9.x.1912, Schwarz & Barber (USNM).

**Distribution.** So far only known from the Netherlands and Maryland, USA.

**Bionomics.** All Dutch specimens were collected from under bark of dead poplar trees (*Populus* sp.).

**Etymology.** The specific epithet is a substantive in apposition derived from *Populus* [poplar] and the Latin suffix *-cola* [inhabitant], referring to the microhabitat at both Dutch collecting sites.

## Type material studied

### *Ptilium nigrovittis* LeConte, 1863

*Ptilium nigrovittis* LeConte, 1863: 63. Type locality: New Orleans [USA].

The LeConte collection (MCZ) holds a single specimen, labelled as follows: "La. [?= Louisiana]", "Type / 6627", "Ptinella / nigrovittis / Motsch[ulsky] / New Orleans", "Aug.-Dec. 2004 / MCZ Image / Database". The specimen representing a male of the *forma alata* is mounted on a mica slide and is in rather poor condition, lacking most appendages. It was dissected and the aedeagus mounted in PVP (Lompe 1989) on a glass slide attached to the same pin. The aedeagus is of the simple curved tubular type, similar to that of *Ptinella aptera* (Guérin-Méneville). It is considered a synonym of *Ptinella quercus* (LeConte) (Matthews 1872).

### *Ptilium pini* LeConte, 1863

*Ptilium pini* LeConte, 1863: 62. Type locality: Athens, Georgia [USA].

The LeConte collection (MCZ) holds a single specimen, labelled as follows: "Type / 6628", "Ptinella / pini / Athens", "Aug.-Dec. 2004 / MCZ Image / Database". The specimen representing the *forma aptera* is point mounted. It is considered a valid species, placed in *Ptinella*.

### *Ptilium quercus* LeConte, 1863

*Ptilium quercus* LeConte, 1863: 63. Type locality: Athens, Georgia [USA].

The LeConte collection (MCZ) holds a single specimen, labelled as follows: "oak bark", "Quercus", "Type / 6626", "Ptinella / quercus / Lec. ", "Aug.-Dec. 2004 / MCZ Image / Database". The specimen representing the *forma aptera* is point mounted and lacks the last abdominal segments. It is considered a valid species, placed in *Ptinella*.

## Discussion

As the north and central European ptiliid fauna has been well studied for over two centuries it is unlikely, even for a tiny *Ptinella* species, to have been overlooked until now. *Ptinella populicola* should therefore be considered a recent immigrant, possibly of Nearctic origin. The early twentieth century records from Plummers Island (USA) suggest a natural occurrence in northeastern North America. However, it can not be excluded that the occurrence at this site was itself already the result of an earlier anthropogenic introduction, Plummers Island being not far (15 km) from Washington, D.C.

The number of introduced ptiliid species that have been successfully established in Europe by human activity is considerable. Sörensson & Johnson (2004) list 13 adventive species, among which are four species of *Ptinella*: *P. cavelli* (Broun, 1893), *P. errabunda* Johnson, 1975, *P. simsoni* (Matthews, 1878), and *P. taylorae* Johnson, 1977. These four species all occupy subcortical habitats and thus could easily have been dispersed through the timber trade from their original ranges in either Australia or New Zealand (Sörensson & Johnson 2004). Of these only one, *P. taylorae*, has both males and females, the other three reproduce parthenogenically. *Ptinella populicola* is the fifth example of a *Ptinella* species established in Europe as a result of human agency.

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