A new species and five new records of chewing lice (Insecta: Phthiraptera: Ischnocera) from an isolated population of the solitary tinamou *Tinamus solitarius* (Aves: Tinamiformes)

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Abstract

We report the first records of chewing lice from an isolated population of the solitary tinamou (formerly known as *Tinamus solitarius pernambucensis* Berla, 1946) in the Pernambuco Centre of Endemism (PCE), Brazil. All louse records previously published from the solitary tinamou came from the populations south of the São Francisco River, formerly known as *Tinamus solitarius solitarius* (Vieillot, 1819). Five known species of the family Heptapsogasteridae were identified from the northern population of this host: *Heptarthrogaster grandis* Carriker, 1936; *Ornicholax alienus* (Giebel, 1874); *Pterocotes solitarius* Guimarães & Lane, 1937; *Rhopaloceras oniscus* (Nitzsch [in Giebel], 1866); and *Strongylocotes wernecki* Guimarães & Lane, 1937. Also, the new species *Heptagoniodes guimaraesi* is described and illustrated from the northern population of this host, and a key for identification of all the species of *Heptagoniodes* Carriker, 1936 is included. The discovery of *H. guimaraesi* is the first Brazilian example of a bird ectoparasite represented by two different species of the same genus living on two distinct populations of the same host species. Records of eight louse species and 31 new localities from the southern population of the solitary tinamou in Brazil are given, and an updated list of all the chewing lice known from both host populations [subspecies] is included.


Introduction

The chewing louse family Heptapsogasteridae comprises a large group of species, all endemic to the Neotropical Region and restricted to the bird families Tinamidae (Tinamiformes) and Cariamidae (Gruiformes) (Carriker 1936, 1944). Many genera have been described to include the species from Tinamidae, and the only two species which occur on members of the non-related family Cariamidae are included in the genus *Heinrothiella* Eichler, 1942. Lice of this family appear to occupy the niche formed by the down feathers near the skin, the same niche occupied by species of Gonioidae parasitic on other basal group of neognathous birds (i.e. Galliformes) (Clay 1957: 155). Tinamou lice are of particular interest because a large number of species may be found co-infesting a single host species, with the most extreme examples of diversity being the brown tinamou, *Crypturellus obsolitus punensis* (Chubb, 1917), with 11 species belonging to 10 genera, and the solitary tinamou, *Tinamus solitarius* (Vieillot, 1819), with eight species in eight genera (Price et al. 2003: 384), but increased in this paper to 12 species in nine genera (see below). In both examples, the louse genera belong to three families from two suborders.

Although the last world checklist of chewing lice (Price et al. 2003, following Hellenthal et al. 2002) regarded the Heptapsogasteridae as a junior synonym of Philopteridae, here we follow the original proposal of Carriker (1936) for this odd morphological, ecological and geographical suprageneric taxon of ischnoceran lice parasitic on
Many taxa found in the isolated forests of PCE have their sister species outside that center of endemism. However, many others have not been critically reviewed and may prove to be simply varieties with no taxonomic significance. Amaral & Silveira (2004) reviewed the taxonomy of *Tinamus* from the Atlantic Forest and found no plumage or other morphological differences between *T. solitarius solitarius* and *T. s. pernambucensis*, making the former name a junior synonym of the latter. However, the geographical barrier of the São Francisco River has led to an unusual distribution pattern of *Heptagoniodes* lice parasitising *T. solitarius*. (Fig. 13). There are other known examples of chewing lice represented by different species on hosts of the same species, which are separated by geographical barriers (Clay 1964, 1976). The case of *H. guimaraesi* and *H. clayae* could be a Brazilian example of ectoparasite speciation caused by a geographic barrier separating its host populations and resulting in two allopatric louse species (Fig. 13). However, to accept this hypothesis the morphological similarity between *H. guimaraesi* and the Amazonian *H. agonus* has to be regarded as result of convergent evolution. Another, more likely scenario to explain that two species of *Heptagoniodes* parasitise two apparently identical but isolated host populations is that the northern population of *T. solitarius* was, at some point, in contact with the Amazonian host *T. tao tao* (Fig. 13). That contact would have allowed a successful host-switch of *Heptagoniodes* from *T. tao tao* onto *T. solitarius*, with a subsequent speciation and an extinction of the original *Heptagoniodes* population on the latter host. This is the most parsimonious hypothesis to explain the morphological similarity of *H. guimaraesi* with *H. agonus*, and not with *H. clayae* in the south of the São Francisco River.

The presence of *H. guimaraesi* only on the northern population of the solitary tinamou would corroborate the original hypothesis of Berla (1946), reopening the question about the validity of *T. s. pernambucensis*. Regardless the validity of this taxon, it is interesting that only one genus of lice, in a set of six, split into two species while the others remained exactly identical but isolated host populations is that the northern population of *T. solitarius* was, at some point, in contact with the Amazonian host *T. tao tao* (Fig. 13). That contact would have allowed a successful host-switch of *Heptagoniodes* from *T. tao tao* onto *T. solitarius*, with a subsequent speciation and an extinction of the original *Heptagoniodes* population on the latter host. Furthermore, it may be significant that *Heptagoniodes* is one of the “rarest” genera of chewing lice collected on *Tinamus* hosts (e.g. Carriker 1936, 1944; Guimarães & Lane 1937).

Judging from the geographic distribution of the specimens studied, *H. guimaraesi* does not appear to occur in any sample from southeastern or southern Brazil (Fig. 13). Considering that the small and restricted northern host population – of less than 100 individuals 40 years ago – is on the verge of extinction (Coimbra-Filho 1971; Silveira *et al.* 2003), it is likely that *H. guimaraesi* is also critically threatened, if not already extinct. Molecular studies of fresh samples of chewing lice may elucidate the true relationship among *H. guimaraesi*, *H. agonus* and *H. clayae*, perhaps showing if the morphological similarity is genetic or due to convergence. Unfortunately, all the material available for this study was stored in suboptimal conditions for an extended period of time, and DNA studies were not possible.

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