

A new species of subgenus *Neodoryctes* Szépligeti (Hymenoptera, Braconidae) from China, with a key to Oriental and Palaearctic species

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Abstract

A new species of subgenus *Neodoryctes* Szépligeti (Hymenoptera: Braconidae), *Doryctes* (*Neodoryctes*) *henanensis* Li & van Achterberg, **sp. n.**, is described and illustrated. This species is associated with *Pterolophia* sp. (Coleoptera: Cerambycidae), a twig-boring pest of *Broussonetia papyrifera* (L.) L'Hert. et Vent. (Moraceae), in Henan (Central China). A key to the Palaearctic species of the subgenus *Neodoryctes* is provided.

Keywords

Doryctinae, Doryctini, *Doryctes*, *Neodoryctes*, new species, parasitoid

Introduction

The subgenus *Neodoryctes* Szépligeti, 1914 of the genus *Doryctes* Haliday, 1836 (Hymenoptera: Braconidae: Doryctinae: Doryctini) includes eight described species, of which six species are known from the Afrotropical Region (Yu et al. 2012). The other two species are known from China (Taiwan) and Japan (Belokobylskij 1996, Belokobylskij

and Maetô 2008). The subgenus *Neodoryctes* can be separated from the nominate subgenus by the relative length of vein 1-M of the hind wing (1.3–1.8 times as long as vein M+CU in *Neodoryctes*; 0.7–1.0, rarely up to 1.1, times in *Doryctes*). In addition, the hind tibia has long erect setae and tergites II+III have sublateral longitudinal grooves. The biology of the species of this subgenus is unknown but members of the subgenus *Doryctes* Haliday are ectoparasitoids of mainly Cerambycidae and Buprestidae (Yu et al. 2012). The subgeneric status of *Neodoryctes* is doubtful according to the study of Zaldívar-Riverón et al. (2008); *Doryctes* and *Neodoryctes* appeared distantly related according to the molecular analysis thus supporting a generic status for *Neodoryctes*.

Here we describe the third non-Afrotropical species of *Neodoryctes*, *D. (Neodoryctes) henanensis* Li & van Achterberg, sp. n., from Henan (Central China).

Materials and methods

Twigs of heavily infested *Broussonetia papyrifera* (L.) L'Hert. et Vent. trees were collected, brought to the laboratory and maintained in a large nylon cage at room temperature. Distilled water was sprayed over the trunks and twigs twice a week in order to prevent desiccation and the emerged insects were collected daily. After the emergence of hosts and parasitoids was complete, all remaining twigs were dissected to record their condition (i.e. status of hosts, and parasitism). The associated host was identified by Dr. Guang-Lin Xie (Yangtze University, Jingzhou, Hubei, China).

For the morphological terminology used in this paper see van Achterberg (1993) and Harris (1979). The descriptions, measurements and figures were made with a Leica M205A microscope. Focused photographs were combined using Leica DFC550 with Leica Application Suite (Version 4.5.0).

The type specimens and hosts are deposited in the Insect Museum, General Station of Forest Pest Management (GSFPM), State Forestry Administration, Shenyang, China. One paratype is deposited at the Naturalis Biodiversity Center (RMNH), Leiden, The Netherlands.

Key to Palaearctic and Oriental species of the subgenus *Neodoryctes Szépligeti*

- 1 Mesoscutum mainly striate or rugose (Fig. 5) and dorsal face of propodeum reticulate-rugose (Fig. 7); dorsal tooth on hind coxa absent (Fig. 8); vein m-cu of hind wing straight posteriorly (Fig. 12); second metasomal suture hardly impressed (Figs 1, 13) 2
- Mesoscutum and dorsal face of propodeum smooth or granulate; small dorsal tooth on hind coxa present; posteriorly vein m-cu of hind wing curved distally; second metasomal suture distinctly impressed 3
- 2 Apical half of vein M+CU1 of fore wing strongly curved (Fig. 12); vein 1-M of hind wing 1.5–1.6 × as long as vein M+CU (Fig. 12); vein 3-SR of fore

- wing about $1.6 \times$ as long as vein m-cu; medial part of tergite II (between sublateral grooves) distinctly transverse (about twice wider than long medially); ovipositor sheath about as long as fore wing; propodeum weakly areolate.....
 *D. henanensis* Li & van Achterberg, sp. n.
- Apical half of vein M+CU1 of fore wing slightly curved; vein 1-M of hind wing about $1.3 \times$ as long as vein M+CU; vein 3-SR of fore wing about $1.2 \times$ as long as vein m-cu; medial part of tergite II about $1.2 \times$ wider than long medially; ovipositor sheath $0.60\text{--}0.75 \times$ as long as fore wing; propodeum distinctly areolate..... *D. slavianka* Belokobylskij, 1996
- 3 Mesoscutum and dorsal face of propodeum smooth; setae on dorsal surface of hind tibia long and erect; hind coxa with distinct submedian dorsal tooth; vein SR of hind wing largely absent; apical width of tergite I $1.2\text{--}1.4 \times$ its basal width..... *D. denticoxa* Belokobylskij, 1996
- Mesoscutum and dorsal face of propodeum granulate; setae on dorsal surface of hind tibia short and semi-erect; hind coxa with minute and hardly protruding dorsal tooth; basal half of vein SR of hind wing present; apical width of tergite I $1.5\text{--}1.8 \times$ its basal width *D. makiharai* Belokobylskij & Maetô, 2008

Description

Doryctes (Neodoryctes) henanensis Li & van Achterberg, sp. n.

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Figs 1–13

Type material. Holotype, ♀ (GSFPM), China: Henan, Xinxiang, 3.vi.2013, Mao-Ling Sheng. Paratypes (RMNH, GSFPM): 1 ♀ + 1 ♂, same data as holotype.

Diagnosis. Frons weakly concave behind antennal sockets, with 3–4 furrows. POL $1.2 \times$ Od, $0.5 \times$ OOL. Width of face $0.8 \times$ height of eye, $1.2 \times$ height of face and clypeus combined. Apical half of vein M+CU1 of fore wing strongly curved, vein 3-SR of fore wing about $1.6 \times$ as long as vein m-cu and vein 1-M of hind wing $1.5\text{--}1.6 \times$ as long as vein M+CU. Tergite II with oblique lateral depressions, medial part of tergite II (between sublateral grooves) distinctly transverse (about twice wider than long medially). Ovipositor sheath $1.3 \times$ as long as metasoma and as long as fore wing.

Holotype. Female, length of body 5.8 mm, and of fore wing 4.8 mm (Fig. 1).

Head (Figs 2–3). Head width $1.3 \times$ its median length in dorsal view, $1.1 \times$ width of mesoscutum. Temple behind eye (dorsal view) roundly narrowed. Frons (Fig. 3) weakly concave behind antennal sockets, with 3–4 furrows. Stemmaticum (ocellar triangle) situated before middle of head. Ocelli medium-sized, and lateral areas weakly concave. POL $1.2 \times$ Od, $0.5 \times$ OOL. Eyes glabrous, slightly concave near antennal sockets, $1.2 \times$ higher than wide. Diameter of antennal sockets $0.8 \times$ distance between antennal sockets, $2.3 \times$ distance between socket and eye. Face (Fig. 2) uniformly convex, with fine rugae and long setae, medially glabrous under sockets, rugae weaker



Figure 1. *Neodoryctes benanensis* Li & van Achterberg, sp. n., female, holotype. Habitus, lateral aspect.

laterally; width of face $0.8 \times$ height of eye, $1.2 \times$ height of face and clypeus combined. Length of malar space $0.4 \times$ height of eye and $1.1 \times$ basal width of mandible. Malar suture absent. Clypeus suture complete. Hypoclypeal depression round, equal to distance from depression to eye and $0.4 \times$ as wide as face. Occipital carina complete dorsally, ventrally remaining separated from hypostomal carina. Length of maxillary palp $1.3 \times$ height of head. Antenna (Figs 1, 4) broken (holotype), remaining antennal articles 34, setiform and slender. Scape $1.6 \times$ longer than its maximum width (Fig. 4). Third article $5.5 \times$ longer than its apical width ($4.8 \times$ in paratype) and $1.2 \times$ as long as fourth article (as in paratype). Paratype with 39 antennal articles and antenna $1.3 \times$ longer than body. Penultimate antennal article of paratype $3.1 \times$ longer than its maximum width and about as long as apical segment.

Mesosoma (Figs 5–6). Mesosoma $2.4 \times$ longer than high. Pronotum convex dorsally and distinctly concave medially, with irregular rugae. Mesoscutum largely covered with curved rugae (Fig. 5), interspaces smooth and strongly shiny and middle lobe of mesoscutum distinctly convex with fine median furrow, its posterior third glabrous. Notauli complete, distinctly crenulate anteriorly but posterior half shallowly crenulate and in a medio-posterior rugose area. Scutellar sulcus wide, deep, with a coarse median carina, almost smooth, $0.4 \times$ as long as scutellum. Scutellum slightly convex and smooth, but rugulose posteriorly, its lateral carinae almost complete. Metanotum dorso-medially with three distinct carinae. Subalar depression shallow and wide, with short striae. Mesopleuron (Fig. 6) with rugose area anteriorly and with smooth inferior areas. Precoxal sulcus distinctly impressed, smooth and straight. Propodeum convex and reticulate-rugose, vaguely areolate and costulae indistinctly developed (Fig. 7); its median carina about $0.5 \times$ as long as propodeum.



Figures 2–13. *Neodoryctes henanensis* Li & van Achterberg, sp. n., female, holotype, but 6 and 11 of female paratype. **2** Head, front aspect **3** Head, dorsal aspect **4** Basal antennal segments **5** Mesosoma, dorsal aspect **6** Mesosoma, lateral aspect **7** Propodeum, dorsal aspect **8** Hind coxa **9** Hind femur **10** Hind tibia **11** Hind tarsus **12** Wings **13** Metasoma, dorsal aspect.

Wings (Fig. 12). Fore wing: length about $4.0 \times$ as long as its maximum width. Pterostigma $4.3 \times$ as long as its maximum width. Vein M+CU1 strongly curved; vein r-m present, weakly oblique; vein 2-M present; vein r arising from near middle of pterostigma; 2-SR $1.4 \times$ as long as r, $0.7 \times$ as long as 3-SR, $0.3 \times$ as long as SR1, $1.5 \times$ as long as r-m; 1-SR+M curved; 1-CU1 $0.2 \times$ as long as 2-CU1; 3-CU1 $0.5 \times$ as long as m-cu. Hind wing: vein 1-M $1.6 \times$ as long as M+CU; vein m-cu straight posteriorly; vein SR present basally.

Legs (Figs 6, 8–11). Fore tibia with 7–8 strong spines arranged in almost single straight row. Hind coxa (Fig. 8) $1.6 \times$ as long as wide, rugose dorsally and without tooth; hind femur $2.6 \times$ as long as wide and with long erect setae (Fig. 9); hind tibia with medium-sized erect setae (Fig. 10); hind tarsus (Figs 10–11) almost as long as to hind tibia; basitarsus (Fig. 11) $0.9 \times$ as long as second-fifth segments combined; second segment of hind tarsus $0.4 \times$ as long as basitarsus, $1.5 \times$ as long as telotarsus (without arolium).

Metasoma (Fig. 13). Length $1.1 \times$ as long as head and mesosoma combined. Tergite I $1.1 \times$ longer than wide apically, with large dorsope, its surface with distinct, uniform and complete striae, and with minute transverse sculpture between striae; medio-posteriorly weakly convex and smooth; dorsal carinae conspicuous and half as long as tergite I; apical width $1.6 \times$ its basal width. Tergite II with oblique lateral depressions, medial part of tergite II (between sublateral grooves) distinctly transverse (about twice wider than long medially), tergites II+III $0.9 \times$ as long as its basal width, 1.8 times as long as tergite IV in lateral view; its surface with distinct, uniform and complete striae in basal 0.7 , smooth in apical 0.3 ; second suture hardly impressed, striate and curved. Basal half of tergites IV and V with fine sculpture, and apically (as remaining tergites) smooth. Ovipositor sheath $1.3 \times$ as long as metasoma and as long as fore wing.

Colour. Black. Head brown but stemmaticum and apical half of mandible blackish brown, median part of face and scape yellowish brown with some reddish, apical half of antenna rather dark brown; pronotum, mesoscutum, mesopleuron (apically dark brown) and mesosternum reddish brown; tegula, fore leg (but femur and tibia blackish brown), mid leg (but coxa, femur and tibia blackish brown), hind trochanters and base of tibia, yellowish brown; pterostigma (except for yellowish brown base and apex) and veins blackish brown; sublateral striae of tergite II dark reddish brown.

Male. Length of body 4.2 mm, and of fore wing 2.9 mm. Antennal articles 29, antenna $1.1 \times$ longer than body. Length of mesosoma $2.8 \times$ longer than high. Length of tergite I $1.5 \times$ as long as its apical width and apical width $1.7 \times$ its basal width. Length of tergites II+III $1.8 \times$ its basal width, $2.2 \times$ as long as length of tergite IV. Head (but stemmaticum and apical half of mandible blackish brown; basal half of antenna yellow, apical half brown), fore leg, mid leg (but telotarsus and claws blackish brown), hind leg (but coxa and most of femur yellowish brown with some reddish; telotarsus and claws blackish brown), pterostigma and veins yellowish brown; pronotum and mesoscutum yellowish brown with some reddish; propodeum and metasoma reddish brown and partly blackish.

Variation. Female paratype has length of body 4.6 mm, and of fore wing 3.7 mm. Head (but stemmaticum and apical half of mandible blackish brown; apical half of an-

tenna brown), legs except claws blackish brown, tegulae, yellowish brown; pterostigma (but basally and apically yellowish brown) and veins brown; pronotum and mesoscutum yellowish brown with some reddish; scutellum, propodeum, hind coxa and metasoma (but tergites II+III yellowish brown with some reddish), dark reddish brown.

Biology. Presumably larval parasitoid of *Pterolophia* sp. (Coleoptera: Cerambycidae) boring in *Broussonetia papyrifera* (L.) L'Hert. et Vent. (Moraceae).

Distribution. Palaeartic China (Henan).

Remarks. The new species belongs to the subgenus *Neodoryctes* Szépligeti because of the short vein 1-M of the hind wing. It can be separated from other Palaeartic and North Oriental species of this subgenus by having vein 3-SR of fore wing about $1.6 \times$ as long as vein m-cu, apical half of vein M+CU1 of fore wing strongly curved and vein 1-M of hind wing $1.5\text{--}1.6 \times$ as long as vein M+CU (vein 3-SR of fore wing about $1.0\text{--}1.5 \times$ as long as vein m-cu, apical half of vein M+CU1 of fore wing slightly curved and vein 1-M of hind wing about $1.3\text{--}1.4 \times$ as long as vein M+CU in the remaining species). It shares with *D. slavianka* Belokobylskij, 1996, from Korea and Far East Russia, the lack of a dorsal tooth on the hind coxa and the striate or rugose mesoscutum; however, it differs from the latter species by having the medial part of tergite II (between the sublateral grooves) distinctly transverse (about twice wider than long medially; about $1.2 \times$ in *D. slavianka*), the ovipositor sheath about as long as fore wing ($0.60\text{--}0.75 \times$), the propodeum weakly areolate (distinctly areolate) and vein M+CU1 of fore wing distinctly curved (nearly straight).

Etymology. The specific name is derived from the locality of the holotype.

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