

Four New Species of the Conifer Sawfly Genus *Nesodiprion* (Hymenoptera, Diprionidae) from Japan

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Abstract Four new species of the diprionid sawfly genus *Nesodiprion*, *N. albiventris*, *N. shinoharai*, *N. nigerrimus*, and *N. kagaensis*, are described and illustrated from Japan, and a key is provided for their identification and separation from *N. japonicus* (Marlatt).

Key words : Symphyta, Diprionidae, *Nesodiprion*, new species, Japan.

Nesodiprion Rohwer, 1910, is a small genus of conifer sawfly family Diprionidae, known so far from six species all occurring in East Asia (Smith, 1974; Xiao et al., 1991). From Japan, only one species, *N. japonicus* (Marlatt, 1898), has been recorded.

Recently, I had an opportunity to examine about 30 specimens of *Nesodiprion* from Japan. After comparative examination, I divided them into five species, including *N. japonicus*. Three of the four remaining species are very closely allied to *N. japonicus*, but they are separated from the latter by the black coloration of the abdomen. A fourth species is easily separated from the others by the peculiar yellow-white coloration of thorax and abdomen. These four species also distinctly differ from the other congeners distributed in China and Thailand. Therefore, I concluded that these species are new to science. They are described and illustrated below.

Type material of the new species described in this paper is deposited in the collection of the National Science Museum (Nat. Hist.), Tokyo.

Genus *Nesodiprion* Rohwer

Nesodiprion Rohwer, 1910, Proc. U. S. natn. Mus., 39, p. 104. Type species: *Lophyrus japonicus* Marlatt, original designation.

Generic characters. Malar space distinct; clypeus slightly emarginate in front; antenna biramose; inner hind tibial spur about as long as hind basitarsus.

Key to females of Japanese species

1. Abdomen black, at most with 7th and 8th tergites laterally pale-marked 2
- Abdomen dirty white, with posterior margin of 2nd tergite, posterior 1/3 of 3rd tergite, 4th and 5th tergites except for lateral sides, and two small maculae on

- 8th and 9th tergites pale brown to dark brown (2 basal segments of antenna dirty white; legs dirty white; sawsheath in lateral and dorsal views as in Figs. 28, 33) *albiventris* sp. nov.
2. Third antennal segment with a long projection (Figs. 1, 3–5); antenno-ocular distance distinctly longer than distance between antennal sockets (ratio about 1.4–1.9 : 1.0)..... 3
- Third antennal segment with a very short projection, or projection nearly absent (Fig. 2); antenno-ocular distance slightly longer than distance between antennal sockets (ratio about 1.2 : 1.0) (sawsheath in lateral and dorsal views as in Figs. 29, 34) *shinoharai* sp. nov.
3. Lateral sides of 7th and 8th abdominal tergites with oval dirty yellowish white macula (Fig. 27); latero-posterior margin of pronotum dirty yellowish white; mesoscutellum white; all knees entirely black (sawsheath in lateral and dorsal views as in Figs. 32, 37) *japonicus* (Marlatt)
- Seventh and 8th tergites entirely black; latero-posterior corner of pronotum yellow or black; mesoscutellum black, but sometimes with a small yellowish white macula; all knees dirty yellow 4
4. Antenna 24-segmented; hind basitarsus slightly shorter than two following segments combined (ratio about 1.0 : 1.1); mesoscutellum entirely black; sawsheath in lateral and dorsal views as in Figs. 30, 35 *nigerrimus* sp. nov.
- Antenna 22-segmented; hind basitarsus slightly longer than two following segments combined (ratio about 1.0 : 0.9); mesoscutellum with a small yellowish white macula; sawsheath in lateral and dorsal views as in Figs. 31, 36.....
- *kagaensis* sp. nov.

Nesodiprion albiventris sp. nov.
(Figs. 1, 6, 11–12, 17, 22, 28, 33, 38)

Female. Length 7.5 mm. Head and thorax black, with following parts dirty yellowish white: clypeus, labrum, latero-posterior portion of pronotum, tegula, lateral side of praescutum, mesoscutellum, perapteron, and mesepisternum. Antenna black but two basal segments dirty yellowish white. Legs dirty yellowish white but apical portion of hind tibia dark brown. Abdomen dirty white, with following parts pale brown to dark brown: posterior margin of 2nd tergite, posterior 1/3 of 3rd tergite, 4th and 5th tergites except for lateral sides, and two small maculae on 8th and 9th tergites; cercus and sawsheath entirely black.

Head transverse; eyes large, in dorsal view, 5 times as long as head behind eye; OOL : POL : OCL=0.7 : 1.0 : 0.8; circumocellar, interocellar, postocellar, and lateral furrows distinct; postocellar area convex; frontal area nearly flattened; median fovea distinct and rather deep, Y-shaped; lateral fovea deep, linear, connected with antennal furrow; supraclypeal area nearly flattened; antenno-ocular distance longer than dis-

tance between antennal sockets (ratio about 1.0 : 0.6); malar space 1/2 as long as diameter of front ocellus.

Antenna 23-segmented; basal five and apical five segments as in Figs. 1 and 6; pedicel rectangular (length : width about 1.0 : 1.9).

Thorax: normal. Legs: hind basitarsus slightly longer than two following segments combined (ratio about 1.0 : 0.8–0.9) (Fig. 22); claw as in Fig. 12.

Abdomen: normal; sawsheath in lateral, dorsal and ventral views as in Figs. 28, 33 and 38; lancet lost.

Punctuation. Head covered with distinct but rather shallow and sparse punctures, lower half of face shagreened; clypeus nearly impunctate, shining. Thorax distinctly and rather closely punctures; lateral sides of praescutum, posterior portion of scutum, and central portion of mesoscutellum nearly impunctate; mesepimeron shagreened. First abdominal tergite nearly impunctate; 2nd to last tergites shagreened.

Male. Unknown.

Distribution. Japan (Okinawa Prefecture).

Holotype: ♀, Kume Is., Okinawa Prefecture, 2. XI. 1978, M. Kinjo leg.

Remarks. This new species is easily separated from the other congeners by the peculiar yellowish white coloration of the abdomen (the abdomen is black in other Japanese species).

Nesodiprion shinoharai sp. nov.

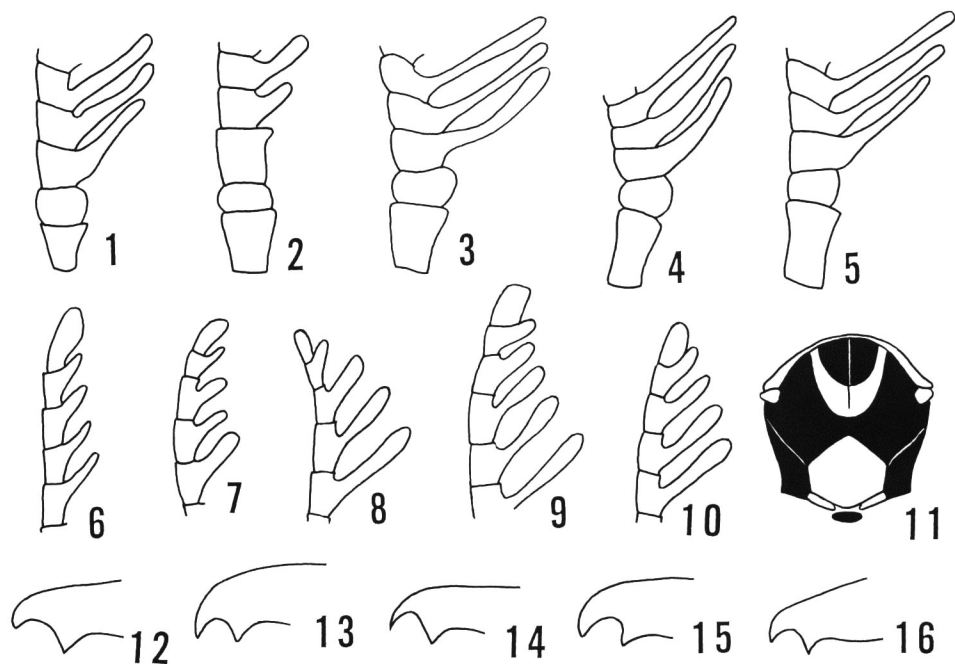
(Figs. 2, 7, 13, 18, 23, 29, 34, 39, 43)

Female. Length 7.5 mm. Body black. Labrum dark reddish brown. Antenna black. Wings nearly hyaline; basal portion of stigma of forewing milky white, apical portion of stigma and other veins dark brown to black. Legs: coxae and femora black, trochanters dark reddish brown, front tibia and tarsus dirty white; posterior four tibiae dirty white but apical portion black; posterior four tarsi dirty white, becoming darker apically.

Head transverse; eye large, in dorsal view nearly 2.8 times as long as head behind eyes; OOL : POL : OCL = 1.2 : 1.0 : 1.0; postocellar area slightly convex; circum-ocellar, interocellar, and lateral furrows distinct; postocellar furrow slightly depressed; frontal area slightly convex; median fovea deep, rather elongate; lateral fovea distinct, circular in outline; antenno-ocular distance slightly longer than distance between antennal sockets (ratio about 1.0 : 0.8); supraclypeal area convex; malar space long, nearly as long as diameter of front ocellus.

Antenna 23-segmented; 3rd antennal segment with a very short projection, or projection nearly absent (Fig. 2); basal five and apical five segments as in Figs. 2 and 7; pedicel rectangular (length : width about 1.0 : 1.8).

Thorax: normal; mesoscutellum nearly flattened. Legs: hind basitarsus nearly as long as following two segments combined (Fig. 23); claw as in Fig. 13.



Figs. 1-16. *Nesodiprion* spp., five basal (1-5) and five apical (6-10) segments of antenna, lateral view, thorax, dorsal view (11), and tarsal claw, lateral view (12-16). — 1, 6, 11-12, *N. albiventris* sp. nov.; 2, 7, 13, *N. shinoharai* sp. nov.; 3, 8, 14, *N. nigerrimus* sp. nov.; 4, 9, 15, *N. kagaensis* sp. nov.; 5, 10, 16, *N. japonicus* (Marlatt).

Abdomen: normal; sawsheath in lateral, dorsal and ventral views as in Figs. 29, 34 and 39; lancet as in Fig. 44.

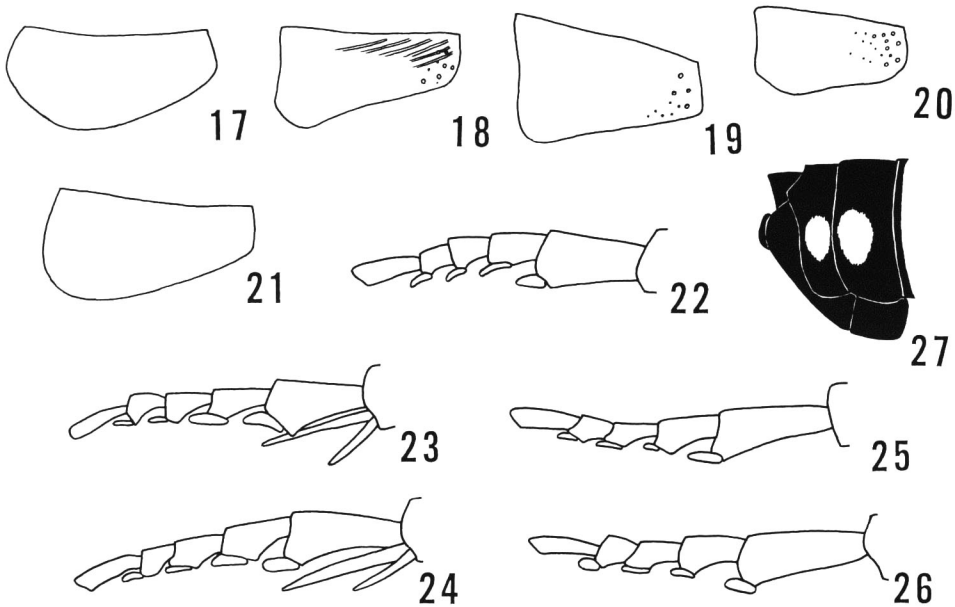
Punctuation. Head distinctly and densely punctured, interspaces between punctures shining; labrum impunctate, shining; pronotum and metascutellum covered with dense but shallow punctures; sunken areas and metanotum nearly impunctate; central portion of 1st tergite with some oblique striae and with some shallow punctures (Fig. 18); other tergites rather shagreened.

Male. Unknown.

Distribution. Japan (Honshu).

Holotype: ♀, Mt. Ohtakiyama, Nagano Prefecture, 22. VII. 1968, A. Shinohara leg.

Remarks. This new species is closely allied to *N. japonicus* (Marlatt), but is easily distinguished from the latter by the oblique striae on the 1st tergite (in *japonicus*, the 1st tergite has no striae) and the shape of the sawsheath (in *japonicus*, the sawsheath is broad in dorsal view, see Figs. 34 and 37). The very short projection of the 3rd antennal segment is distinctive.



Figs. 17–27. *Nesodiprion* spp., left half of 1st tergite, dorsal view (17–21), hind tarsus, lateral view (22–26), and 7th to 9th abdominal segments, lateral view (27). — 17, 22, *N. albiventris* sp. nov.; 18, 23, *N. shinoharai* sp. nov.; 19, 24, *N. nigerrimus* sp. nov.; 20, 25, *N. kagaensis* sp. nov.; 21, 26–27, *N. japonicus* (Marlatt).

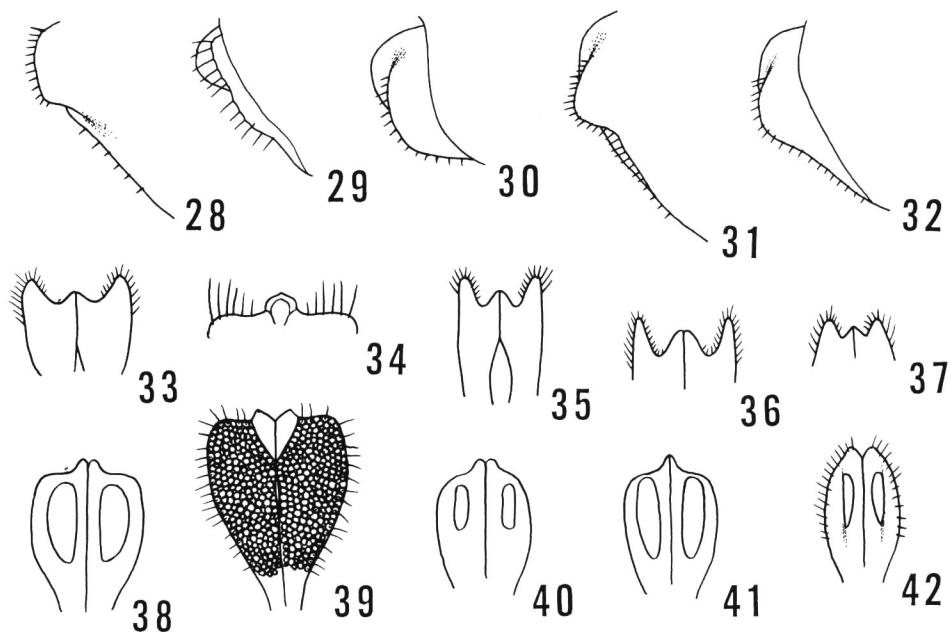
***Nesodiprion nigerrimus* sp. nov.**

(Figs. 3, 8, 14, 19, 24, 30, 35, 40, 44)

Female. Length 9 mm. Body black but apical half of mandible reddish brown, palpi dark brown, posterior corner of pronotum yellowish brown. Antenna black. Wings hyaline; stigma and costa of forewing pale brown, other veins dark brown to black. Legs black with following parts dirty white: all trochanters, all knees, anterior four tibiae, hind tibiae except for apical portion, and all tarsi, becoming darker apically.

Head transverse; eyes large, in dorsal view nearly 2.8 times as long as head behind eyes; OOL : POL : OCL = 1 : 1 : 1; circumocellar, interocellar, and lateral furrows distinct; lateral furrows rather deep; postocellar area slightly convex; frontal area nearly flattened; median fovea distinct, linear in form; lateral fovea distinct, circular in outline; supraclypeal area slightly convex; antenno-ocular distance longer than distance between antennal sockets (ratio about 1.0 : 0.5–0.6); malar space shorter than diameter of front ocellus (ratio about 1.0 : 1.9).

Antenna 24-segmented; pedicel rectangular (length : width about 1.0 : 1.9).



Figs. 28–42. *Nesodiprion* spp., sawsheath, lateral (28–32), dorsal (33–37), and ventral (38–42) view. — 28, 33, 38, *N. albiventris* sp. nov.; 29, 34, 39, *N. shinoharai* sp. nov.; 30, 35, 40, *N. nigerrimus* sp. nov.; 31, 36, 41, *N. kagaensis* sp. nov.; 32, 37, 42, *N. japonicus* (Marlatt).

Thorax: normal; mesoscutellum slightly convex, with median longitudinal furrow. Legs: hind basitarsus slightly shorter than following two segments combined (ratio about 1.0 : 1.1); claw as in Fig. 14.

Abdomen: normal; sawsheath in lateral, dorsal and ventral views as in Figs. 30, 35, and 40; lancet as in Fig. 43.

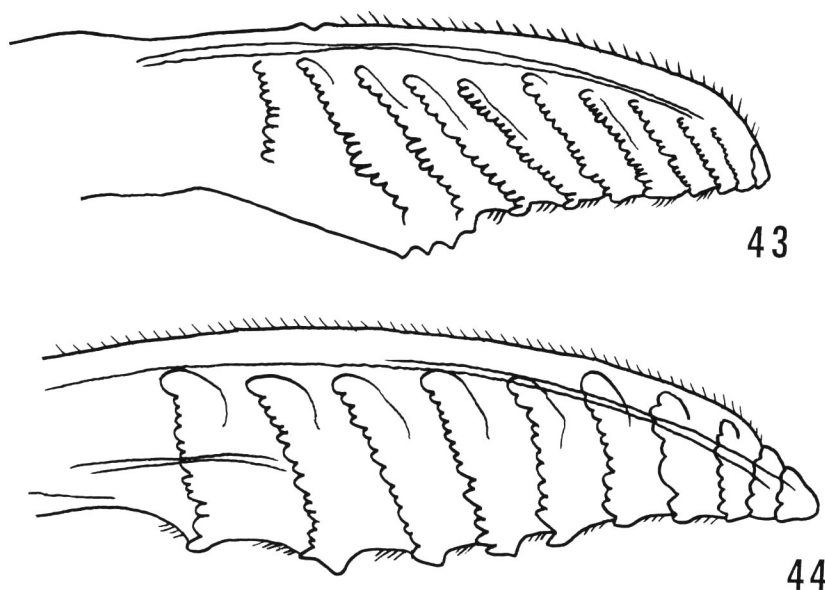
Punctuation. Head and thorax moderately, distinctly and evenly punctured, interspaces between punctures shining; metascutellum largely and densely punctured; sunken areas covered with oblique striae; central portion of 1st tergite covered with rather fine, shallow, and sparse punctures; 2nd to last tergites practically impunctate, shining.

Male. Unknown.

Distribution. Japan (Kyushu).

Holotype: ♀, Beppu, Oita Prefecture, 10. V. 1932, Sugiura leg.

Remarks. This new species is very closely allied to *N. japonicus*, but is easily distinguished from the latter by the punctures on the 1st tergite (in *japonicus*, the 1st tergite has no punctures), by the shape of the sawsheath (see Figs. 30, 32, 35, and 37), and by the black mesoscutellum (in *japonicus*, the mesoscutellum is white).



Figs. 43–44. *Nesodiprion shinoharai* sp. nov. (43) and *N. nigerrimus* sp. nov. (44), lancet, lateral view.

***Nesodiprion kagaensis* sp. nov.**

(Figs. 4, 9, 15, 20, 25, 31, 36, 41)

Female. Length 8 mm. Body black, but palpi dark brown, lateral portion of pronotum brown, small macula on mesoscutellum yellowish white. Antenna black but basal two segments dark brown. Wings hyaline; stigma except for frontal margin and costa of forewing brown, frontal margin of stigma and other veins dark brown to black. Legs black with the following parts dirty yellow: all trochanters, all knees, anterior four tibiae, hind tibia except for apical portion, and all tarsi (becoming darker apically).

Head transverse; eye large, in dorsal view, nearly 2.8 times as long as head behind eyes; OOL : POL : OCL = 1.1 : 1.0 : 1.0; circumocellar, interocellar, postocellar, and lateral furrows distinct; postocellar area slightly convex; frontal area nearly flattened; median fovea two-spotted; lateral fovea distinct, circular in outline; antenno-ocular distance longer than distance between antennal sockets (ratio about 1.0 : 0.6); supraclypeal area slightly convex; malar space shorter than diameter of front ocellus (ratio about 1.0 : 1.7).

Antenna 22-segmented; pedicel rectangular (length : width about 1.0 : 2.3).

Thorax: normal; mesoscutellum nearly flattened with a median longitudinal suture. Legs: hind basitarsus slightly longer than following two segments combined

(ratio about 1.0 : 0.9); claw as in Fig. 15.

Abdomen: normal; sawsheath in lateral, dorsal and ventral views as in Figs. 31, 36 and 41; lancet lost.

Punctuation. Head and thorax moderately, distinctly and evenly punctate, interspaces between punctures shining; metascutellum covered with large and distinct punctures; central portion of 1st to 3rd tergites covered with some shallow punctures (Fig. 21); 4th to last tergites nearly impunctate, shining.

Male. Unknown.

Distribution. Japan (Honshu).

Holotype: ♀, Yoshioka, Kawachi-mura, Ishikawa Prefecture. 10. V. 1969, I. Togashi leg.

Remarks. This new species is closely allied to *N. japonicus*, but it is easily distinguished from the latter by the punctures on the 1st tergite (in *japonicus*, the 1st tergite has no punctures), and by the shape of the sawsheath (in *japonicus*, the sawsheath is broad in dorsal view, see Figs. 36–37).

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References

- Rohwer, S. A., 1910. Japanese sawflies in the collection of the United States National Museum. *Proc. U. S. natn. Mus.*, **39**: 99–120.
- Smith, D. R., 1974. Conifer sawflies, Diprionidae: key to North American genera, checklist of world species, and new species from Mexico (Hymenoptera). *Proc. ent. Soc. Wash.*, **76**: 409–418.
- Xiao, G.-r., X.-y. Huang, S.-z. Zhou, J. Wu & P. Zhang, 1991. Economic Sawfly Fauna of China (Hymenoptera, Symphyta). 226 pp. Tianze Eldonejo, Beijing. (In Chinese.)