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Systematics and Evolution of Weevils of the Genus *Bagous* Germar (Coleoptera: Curculionidae) IV. Three New Species from Japan¹⁾

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Abstract. Three species of *Bagous* are described as new from Japan, *B. yamazakii* O'Brien & Morimoto, *B. fractodes* O'Brien & Morimoto, and *B. nipponensis* O'Brien & Morimoto. *Bagous yamazakii*, known only from males, possibly represents an entirely new species group, but probably is related to the *B. hydrillae* group, the species of which are in Australia. *Bagous fractodes*, known only from a single male, is similar to *B. fractus* of Japan, but evidently is not closely related to it. *Bagous nipponensis* is known only from a single female; it is clearly not any species hitherto known from Japan, but its phylogenetic position is equivocal.

The key to Japanese species is modified to include these three new species. *Habitus* photographs and line illustrations of genitalia are provided.

INTRODUCTION

The *Bagous* Germar of Japan was recently revised (O'Brien et al., 1994), and their phylogenetic relationships were analyzed (Askevold et al., 1994). At the time those manuscripts were in press, a series of four specimens was discovered that had been collected at Lake Tega in Chiba Prefecture, Japan. Study of genitalia of all of these specimens revealed three species, each with distinct genital structure, three male specimens and one female specimen. It was not possi-

1) Contribution from the Entomological Laboratory, Faculty of Agriculture, Kyushu University, Fukuoka (Ser. 4, No. 73).

ble then to include them in the publications in press.

Given that the Japanese *Bagous* were so recently studied, it is unlikely that they will be studied in detail again, in the foreseeable future. Therefore, we take this opportunity to describe these new species and to place them phylogenetically in relation to all known Japanese species of the genus. The present paper is the fourth in an ongoing series of publications on the genus *Bagous*.

Descriptions were generated using DELTA (Askevold & O'Brien, 1994). Structures that are used in classification, description and phylogeny of *Bagous* are described or discussed in detail previously (O'Brien et al. 1994, Askevold et al. 1994), and this information is not repeated here.

Revised key to the *Bagous* of Japan.

- 1 Elytra lacking declivital callus on interval 5; elytral scales arranged in regular pairs on each interval; body length usually less than 2.00 mm., at most 2.10 mm. 2
- 1' Elytra with small to large declivital callus on interval 5; elytral scales more numerous, densely and irregularly arranged on each interval; body length greater than 2.00 mm., usually more than 2.30 mm. 3
- 2(1) Antennae inserted just behind apical 1/4 of rostrum; elytra with transverse broad white fascia surrounding brown to black large declivital macula.
..... *pygmaeodes* O'Brien & Morimoto
- 2' Antennae inserted just behind apical 2/5 of rostrum; elytra with transverse short broad antedecrivital white fascia, and oblique post humeral white fascia, and scattered white maculae. *minor* O'Brien & Morimoto
- 3(1') Antedecrivital swelling of elytral interval 3 strongly tuberculate.
..... *tuberculosis* O'Brien & Morimoto
- 3' Antedecrivital swelling of elytral interval 3 lacking or very weakly developed, not tuberculate. 4
- 4(3') Tarsi long, tarsomere 3 linear; antennae inserted just in front of middle of rostrum; scape moderately short; elytra usually lacking vittae or maculae.
..... *buckinghami* O'Brien & Morimoto
- 4' Tarsi short to moderately long, tarsomere 3 sublinear to subcordate; antennae inserted subapically, always well in front of middle of rostrum; scape usually moderately long to long; elytra with pale vittae and/or maculae. 5
- 5(4') Tarsomere 3 broadly cordate, apex rather deeply emarginate; body robust to very robust; body length usually greater than 3.10 mm. 6
- 5' Tarsomere 3 subcordate to sublinear, apex slightly emarginate to truncate; body moderately robust to moderately slender; body length usually less than 3.00 mm.
..... 7
- 6(5) Funicle long, 0.95 as long as scape; declivital callus of elytral interval 5 well-developed; cuticle black. *bipunctatus* (Kôno)
- 6' Funicle short, 0.64 as long as scape; declivital callus of elytral interval 5 moderately developed; cuticle red. *ryukyuensis* O'Brien & Morimoto
- 7(5') Tarsomere 3 subcordate. 8

- 7' Tarsomere 3 sublinear. 11
- 8(7) Basal margin of pronotum lacking carina; frons with median fovea. 9
- 8' Basal margin of pronotum with indistinct to distinct carina in median 1/2 to 1/3; frons with median sulcus. 10
- 9(8) Rostrum of male and female longer than prothorax (1.07); ventral margin of rostrum distinctly carinate; declivital callus of elytral interval 5 weakly developed, subangulate. *spiculatus* O'Brien & Morimoto
- 9' Rostrum of female (males unknown) shorter than prothorax (0.89); ventral margin of rostrum subcarinate; declivital callus of elytral interval 5 well-developed, subquadrate. *lewisi* O'Brien & Morimoto
- 10(8') Basal margin of pronotum with distinct carina in median 1/2; antedecrivital swelling of interval 3 weakly developed, but evident; sternum 5 with two pairs of apicolateral setae. *kagiashi* Chûjô & Morimoto
- 10' Basal margin of pronotum with indistinct carina in median 1/3; antedecrivital swelling of elytral interval 3 lacking; sternum 5 with one pair of apicolateral setae. *subcordatus* O'Brien & Morimoto
- 11(7') Rostrum with apical median carina well-developed; frons not sulcate nor foveate medially; abdominal sternum 2 not apically declivous; abdominal sterna with punctures moderate in size. *occultus* O'Brien & Morimoto
- 11' Rostrum lacking apical median carina; frons with median sulcus or fovea; abdominal sternum 2 apically weakly to strongly declivous; abdominal sterna with small punctures. 12
- 12(11') Pronotum with indistinct transverse carina in median 1/2 of basal margin; antedecrivital swelling of elytral interval 3 weakly developed, but evident; sternum 5 basally, transversely subcostate; elytral striae with shallow punctures. *proprius* O'Brien & Morimoto
- 12' Pronotum lacking transverse carina or with strong transverse carina in median 3/5 of basal margin; lacking antedecrivital swelling on elytral interval 3; sternum 5 basally, transversely convex or flat; elytral striae with moderately shallow to deep punctures. 13
- 13(12') Pronotum with strong transverse carina in median 3/5 of basal margin; suture straight between abdominal sterna 1 and 2. *subvittatus* O'Brien & Morimoto
- 13' Pronotum lacking transverse carina on basal margin; suture bisinuate between abdominal sterna 1 and 2. 14
- 14(13') Abdominal sternum 2 with multiple rows of evident subrecumbent coarse setae; frons very broad, ca. 0.70 as wide as head across eyes; elytra with declivity at 45 degrees (in relation to dorsal plane). *youngi* O'Brien & Morimoto
- 14' Abdominal sternum 2 with single row of scarcely evident subrecumbent coarse setae (abraded in *rotundatus*); frons broad, less than ca. 0.66 as wide as head across eyes; elytra with declivity at 60 to 75 degrees (in relation to dorsal plane). 15
- 15(14') Declivital callus of elytral interval 5 very weakly developed; rostrum with ventral margin not angulate nor carinate; body elongate broad-oval. *rotundatus* O'Brien & Morimoto
- 15' Declivital callus of elytral interval 5 well-developed; rostrum with ventral margin

- subangulate, not carinate; body elongate oval. 16
- 16(15') Tibiae with scarcely evident, minute denticles; tibial uncus longer than width of tibial apex *yamazakii* O'Brien & Morimoto, new species
- 16' Tibiae with evident, stout denticles; tibial uncus shorter than or subequal to width of tibial apex. 17
- 17(16') Antennae inserted at or just behind apical 1/3 of rostrum; tarsi moderately short. .. 18
- 17' Antennae inserted at apical 1/4 or apical 2/5 of rostrum; tarsi moderately short or moderately long. 19
- 18(17) Antennae inserted at apical 1/3 of rostrum in males; elytra with declivity at 60 degrees (in relation to dorsal plane); sternum 5 basally flat; tibial uncus shorter than width of tibial apex. *fractus* O'Brien & Morimoto
- 18' Antennae inserted just behind apical 1/3 of rostrum in males; elytra with declivity at 75 degrees (in relation to dorsal plane); sternum 5 basally transversely convex; tibial uncus subequal in length to width of tibial apex.
..... *fractodes* O'Brien & Morimoto, new species
- 19(17') Antennae inserted just behind apical 1/4 of rostrum in males; elytra with declivity at 75 degrees (in relation to dorsal plane); tarsi *moderately long.
..... *fritodes* O'Brien & Morimoto
- 19' Antennae inserted at apical 2/5 of rostrum in females (males unknown); elytra with declivity at 60 degrees (in relation to dorsal plane); tarsi moderately short.
..... *nipponensis* O'Brien & Morimoto, new species

***Bagous yamazakii* O'Brien & Morimoto, new species.**

(Figures 3, 4, 8.)

DESCRIPTION. -- *Holotype Male.* -- Body medium-sized, elongate-oval, robust. **Rostrum** long, 1.03 as long as prothorax; black, with apex reddish brown; broadly subcylindrical; with dorsal curvature moderate and uneven; with ventral curvature weak and even; weakly depressed in apical 1/3; with median basal carina lacking; with basolateral carina lacking; with apicolateral carina lacking; with apical median carina lacking; with basolateral sulcus deep, broad, long, coarsely punctate; with ventral margin subangulate, not carinate; with sides unevenly subparallel, expanding in apical 1/2; scrobe visible from above only at point of insertion, glabrous, reaching eye, dorsal margin reaching eye at dorsal margin, basally with ventral margin straight or almost so, meeting rostral margin at very acute angle; with scales dense in basal 2/3, subgranulate, contiguous and subcontiguous, pitted, round, grayish brown, more coarsely subgranulate and pitted basally, sparser apically, subgranulate, not contiguous, finely pitted, round and oval, metallic; with numerous, widely and uniformly spaced, subrecumbent, evident, curled setae; with coarse rugose punctures visible beneath scales in basal 1/2, becoming sparser and finer apically. **Head** weakly convex; swelling beside eye lacking; eyes moderately convex, medium sized; with scales coarsely granulate, contiguous, coarsely pitted, round, gray brown; with plumose scales whitish, on articulating area and behind eyes. Supraocular setae few, short, distinct, subrecumbent, curved, coarse, scale like, linearly arranged. Frons without submedian setae; broad, 0.48 as wide as head across eyes, somewhat flattened, not impressed, not set off from rostrum by impression; with median sulcus, sulcus deep, moderately broad, long. **Antennae**

inserted just behind apical $1/3$, inserted laterally; scape moderately long, moderately slender, clavate; scape and funicle reddish brown; funicle short, 0.77 as long as scape, with segment 1 stout, segment 2 slender, 1 and 2 subequal in length, 3-6 short, 7 short and strongly transverse; segment 7 narrower than first club segment; with pubescence of segment 7 distinctly denser than other segments; distinctly separated from club; club broad-oval, uniformly pubescent, segment 1 shorter than segments 2-4, 0.65 as long as funicle, reddish brown. **Pronotum** weakly transverse, 0.89 as long as broad; with sides sinuately subparallel, not expanding from base; with apical constriction moderate, in apical $1/7$, without longitudinal carinae, dorsally distinct and uniform; laterally weakly rounded behind constriction, with sides slightly impressed behind round area; lacking pit near margin of prosternal sulcus; with median sulcus distinct, broad and narrow, incomplete, forming subapical and subbasal impressions, with subbasal impression large, strong, moderately shallow; with apical impression small, distinct, moderately deep; with median carina lacking; with disc transversely unevenly flattened, not undulate, not rugose or rugulose; with apical and marginal setae numerous, moderately distinct, short, subrecumbent, curved, coarse; with carina of basal margin lacking; with area of plumose scales of basal declivity broad, convex and distinct; with scales coarsely granulate, coarsely pitted, contiguous and subcontiguous, round, blackish brown; with three vittae, with median vitta narrow and broad, interrupted, distinct, uneven, pale brown; with lateral vittae broad, obliquely angled, pale brown; with indefinite dark brown lateral maculae on disc; with sides pale brown, with indefinite blackish brown maculae; with postocular lobes strongly developed, deeply excavated below, reddish brown. **Prosternal sulcus** moderately deep, broad, moderately narrowed at apical constriction, biangulate; with side margins moderately sharply raised, with lateral margin just in front of coxae (lateral view) acute, neither distinctly projecting posterad over forecoxae nor bent inward. **Scutellum** large. **Elytra** subparallel behind humeri to declivity; 1.44 as long as wide across humeri; with disc area flat; with declivity at 60 degrees (in relation to dorsal plane); markedly wider than prothorax; with apices nonacuminate, conjointly slightly emarginate; with humeri well-developed, obliquely angulate, non-acute, somewhat produced; with basal margin more or less flat, at most slightly swollen adjacent to scutellum; with odd-numbered intervals slightly more convex and elevated, broader than even-numbered intervals, with interval 3 more or less uniformly elevated; with setae of odd-numbered intervals conspicuous, short, subrecumbent, curled, coarse, pale, each surrounded by scales of same color as other scales; even-numbered intervals unevenly flattened, interval 2 not impressed; intervals 3-5 on disc strongly sinuately-sided; disc weakly transversely angulately impressed across basal $1/3$, disc not undulating; antedeclivital swelling of interval 3 lacking (though white maculae often appear raised); declivital callus of interval 5 well-developed, subangulate, antedeclivital swelling of interval 5 lacking; confluence of intervals 3 and 9 slightly swollen; striae grooves distinct shallow narrow, with punctures small elongate narrow moderately shallow, not wider than striae grooves; scales granulate, contiguous and imbricate, coarsely pitted, round, arranged irregularly, with three or more scales across intervals, brown, whitish and black; fasciate-maculate; humeri with macula grayish white; antedeclivital callus or area of interval 3 with macula white; declivital callus or area of interval 5 with macula white; otherwise with few small, white maculae and short, oblique white fascia behind humeri directed towards suture, remainder dark brown; cuticle black. Metathoracic wings fully developed. **Abdominal sterna** with punctures lacking (only granules), scales pitted. Sternum 1 with median impression shallow, broad, continuous for entire

length, not deeper apically, slightly narrowed apically, continued shallowly on sternum 2; apical margin not declivous; 1.24 as long as 2; suture between 1 & 2 bisinuate, uniformly deep. Sternum 2 medially impressed, with impression narrow, shallow; apically weakly declivous, not impressed on declivity; 1.42 as long as 3 & 4 together; with transverse row of scarcely evident (often denuded) subrecumbent coarse setae. Sternum 5 with pair of subbasal lateral impressions, with apicomedian area flat, basally transversely subcostate, without tubercles; with lateral impressions shallow, small; with two pairs of apicolateral setae, suberect, coarse; 1.00 as long as 3 & 4 together, 0.71 as long as 2, 0.50 as long as 1. Meso- and metasternum with punctures not forming large concavities; mesosternal process large, subtriangular between coxae; with scales plumose; metasternum 1.29 as long as sternum 1. **Legs** moderately long; femora clavate, black, with basal 1/2 reddish brown. Tibiae slender, reddish brown, with inner margin bisinuate, with outer margin moderately arcuate toward apex (in lateral view); with apex not narrowed; with inner surface with denticles few, indistinct, minute, foretibiae lacking both large acute denticles or spur, denticles of midtibiae like those of foretibiae; with few inconspicuous bristles on inner surface, with short, inconspicuous bristles on outer surface; with **uncus** long, moderately slender, longer than width of tibial apex; hind tibiae as strongly arcuate as fore- and midtibiae, with minute denticles, with one or two short setae on inner surface. **Tarsi** moderately long, sublinear; reddish brown; tarsomeres 1-3 slightly widened toward apex; tarsomere 3 slightly wider at apex than 2, sublinear, subemarginate; tarsomeres ventrally with sparse to dense, subrecumbent to recumbent pubescence, dorsally each with pair of apical dorsal bristles. **Length**, pronotum and elytron: 2.95 mm.

Female. -- Not known.

Genitalia and Associated Structures. -- **MALE.** **Median lobe** with dorsal surface poorly sclerotized, more or less membranous; with ventral surface membranous except at extreme base, with arcuate basal bar; more or less parallel-sided; apical margin broadly and uniformly rounded; with apex in lateral view slender, with extreme apex narrowly rounded; with dorsobasal margin not distinguishable; with ventrobasal margin distinct, deeply emarginate. Orifice very transverse, very short; with proximal margin indistinct, not sclerotized. **Apodemes** long, 1.47 as long as median lobe. Internal sac. Orificial sclerites lacking. **Internal sac** with single prominent spiculate field on one side; with basal sacule containing elongate spicules.

Intraspecific Variation. -- Size range 2.95 mm. No significant variation observed in the two specimens on hand.

Etymological Note. -- This species is named in honor of Mr. Hideo Yamazaki, who collected the type series and other specimens used in this study.

Remarks and Comparative Notes. -- This species resembles *B. occultus* and *B. spiculatus*, but both of these species possess distinct denticles on the tibiae, and clearly differ in the genital morphology. Male genitalia are completely unlike any other known Japanese species and could therefore be confused with no other species. The ventrobasal arcuate transverse bar, membranous dorsal and ventral surfaces of the median lobe, and the basal spiculate sacule and single large lateral spiculate area of the internal sac are distinctive characters.

Biological Notes. -- No data are available.

Type Locality. -- Japan, Honshu, Chiba Prefecture, Lake Tega.

Notes on Type Specimen(s). -- Holotype (by designation) male (dissected), with the following labels: 1) [rectangular; white; printed male symbol in black ink] male 2) [rectangular; white;

printed in black ink] Lake Tega Chiba pref. 5-VI-1967 H. Yamazaki 3) [rectangular; pink with black margins; printed in black ink] DRAWN / Askevold 1994 4) [rectangular; red; printed in black ink] HOLOTYPE / *Bagous yamazakii* / O'Brien & Morimoto, 1994.

Point mounted. Right front and left middle legs missing some tarsomeres. Deposited in Kyushu University, Fukuoka, Japan. Type number 2946.

Range. -- Chiba Prefecture, Honshu, Japan.

Material Examined. -- Holotype and 1 paratype. [JAPAN:] [Honshû:] Lake Tega Chiba pref. 5-VI-1967 H. Yamazaki (holotype, KU); 29-VIII-1967 (1 paratype, CWOB).

Phylogenetic Position. -- The species is very unusual in structure of the median lobe of the male genitalia, with both dorsal and ventral surfaces membranous, but with an arcuate ventrobasal bar. In this respect it is similar to the Australian species *B. josephi*, which has a straight ventrobasal bar. However, *B. yamazakii* also possesses a basal spiculate sacule, which is a structure that is unique to species of the *B. hydrillae* group, which occur only in Australia but with one undescribed species known from India (O'Brien & Askevold, 1995; Askevold & O'Brien, 1995). It is unusual among species of the *B. hydrillae* group, however, because *B. yamazakii* lacks the prominent, acute orificial sclerites and the subbasal paired spiculate areas of the internal sac; these are characters that almost all known species of the group share, save *B. pauxillulus*. An undescribed species from the Philippines is almost identical to *B. yamazakii* and is clearly very closely related, as it possesses the same peculiar structures of the median lobe.

Bagous fractodes O'Brien & Morimoto, new species.

(Figures 1, 2, 7.)

DESCRIPTION. -- **Holotype Male.** -- Body medium-sized, elongate-oval, robust. **Rostrum** moderately long, 0.93 as long as prothorax; black, with apex reddish brown; broadly subcylindrical; with dorsal curvature moderate and even; with ventral curvature nearly straight; not more distinctly depressed toward apex; with median basal carina lacking; with basolateral carina lacking; with apicolateral carina lacking; with apical median carina lacking; with basolateral sulcus deep, narrow, long, coarsely punctate; with ventral margin subangulate, not carinate; with sides unevenly subparallel, moderately subquadrately expanded in apical 1/2; scrobe visible from above only at point of insertion, glabrous, reaching eye, dorsal margin reaching eye just above middle, basally with ventral margin straight or almost so, meeting rostral margin at very acute angle; with scales dense in basal 2/3, subgranulate, contiguous and subcontiguous, pitted, round, metallic and grayish brown, more coarsely subgranulate and pitted basally; with scales sparser apically, subgranulate, not contiguous, pitted, round, metallic; with numerous, widely and uniformly spaced, subrecumbent, evident, curled setae; with coarse rugose punctures visible beneath scales in basal 1/2, with punctures becoming sparser and finer apically. **Head** weakly convex; swelling beside eye lacking; eyes moderately convex, medium sized; with scales coarsely granulate, contiguous, pitted, round, brown and white; with plumose scales yellowish brown, on articulating area and behind eyes. Supraocular setae few, long, distinct, suberect, curved, slender, seta like, linearly arranged. Frons without submedian setae; broad, 0.58 as wide as head across eyes, somewhat flattened, not impressed, not set off from rostrum by impression; with median fovea, fovea shallow, large. **Antennae** inserted just behind apical 1/3,

inserted laterally; scape moderately long, moderately slender, subclavate; scape and funicle reddish brown; funicle short, 0.56 as long as scape, with segment 1 stout, segment 2 slender, 1 and 2 **subequal** in length, 3-6 short, 7 short and strongly transverse; segment 7 narrower than first club segment, with pubescence of segment 7 distinctly denser than other segments, distinctly separated from club; club broad-oval, uniformly pubescent, segment 1 shorter than segments 2-4, 0.90 as long as funicle, reddish black. **Pronotum** weakly transverse, 0.88 as long as broad; with sides sinuately subparallel, not expanding from base; with apical constriction moderate, in apical 1/6, without longitudinal carinae, dorsally distinct and uniform; laterally weakly rounded behind constriction, with sides slightly impressed behind round area; lacking pit near margin of prosternal sulcus; with median sulcus indistinct, very narrow, incomplete; forming subapical and subbasal impressions, with subbasal impression moderately small, weak, moderately shallow; with apical impression small, weak, shallow; with median carina lacking; with disc transversely moderately convex, not undulate, not rugose or rugulose; with apical and marginal setae numerous, moderately distinct, long, suberect, curved, fine; with carina of basal margin lacking; with area of plumose scales of basal declivity broad, convex and distinct; with scales coarsely granulate and rugulose, finely pitted, subcontiguous, round, black; with three vittae, with median vitta moderately broad, interrupted, indefinite, uneven, pale brown; with lateral vittae narrow, obliquely angled, pale brown; with indefinite dark brown lateral maculae on disc; with sides pale grayish brown, with indefinite blackish brown maculae; with postocular lobes moderately developed, not deeply excavated below, reddish brown. **Prosternal sulcus** moderately deep, broad, strongly narrowed at apical constriction, biangulate; with side margins moderately sharply raised, with lateral margin just in front of coxae (lateral view) subacute, with lateral margin neither distinctly projecting posterad over forecoxae nor bent inward. **Scutellum** small. **Elytra** subparallel behind humeri to declivity; 1.44 as long as wide across humeri; with disc area flat; with declivity at 60 degrees (in relation to dorsal plane); markedly wider than prothorax; with apices nonacuminate, conjointly moderately emarginate; with humeri well-developed, obliquely angulate, non-acute, somewhat produced; with basal margin more or less flat, at most slightly swollen adjacent to scutellum; with odd-numbered intervals very slightly more convex and elevated, not broader than even-numbered intervals, with interval 3 more or less uniformly elevated; with setae of odd-numbered intervals conspicuous, long, suberect, curled, fine, pale, each surrounded by scales of same color as other scales; even-numbered intervals unevenly flattened, interval 2 not impressed; intervals 3-5 on disc slightly sinuately-sided; disc weakly transversely angulately impressed across basal 1/3, disc not undulating; antedeclivital swelling of interval 3 lacking; declivital callus of interval 5 well-developed, angulate, antedeclivital swelling of interval 5 lacking; confluence of intervals 3 and 9 swollen; striae distinct, deep, narrow; with punctures small, moderately elongate, narrow, deep, not wider than striae; scales granulate, contiguous and imbricate, finely pitted, round, arranged irregularly, with three or more scales across intervals, brown, whitish and black; fasciate-maculate; humeri with macula pale whitish brown; antedeclivital callus or area of interval 3 with macula greyish white; declivital callus or area of interval 5 with macula white; otherwise with scattered whitish brown maculae, in part forming several transverse fasciae, remainder blackish brown; cuticle black. Metathoracic wings fully developed. **Abdominal sterna** with punctures lacking (only granules), scales finely pitted. Sternum 1 with median impression moderately deep, broad and narrow, continuous for entire length, not deeper

apically, narrowed apically, not continued on sternum 2; apical margin not declivous; 1.23 as long as 2; suture between 1 & 2 bisinuate, uniformly deep. Sternum 2 convex; apical 2/5 declivous, not impressed on declivity; 1.73 as long as 3 & 4 together; with transverse row of scarcely evident (often denuded) subrecumbent coarse setae. Sternum 5 with pair of **subbasal** lateral impressions, with apicomedian area weakly convex, basally transversely convex, without tubercles; with lateral impressions very shallow, small and elongate; with one pair of apicolateral setae, suberect, coarse; 1.47 as long as 3 & 4 together, 0.85 as long as 2, 0.69 as long as 1. **Meso-** and **metasternum** with punctures not forming large concavities; mesosternal process large, subtriangular between **coxae**; with scales plumose; metasternum 1.13 as long as sternum 1. Legs moderately short; femora clavate, reddish brown. Tibiae slender, reddish brown, with inner margin bisinuate, with outer margin slightly arcuate toward apex (in lateral view); with apex not narrowed; with inner surface with denticles several, distinct, stout and small, foretibiae lacking both large acute denticles or spur, denticles of midtibiae like those of foretibiae; with several moderately short bristles on inner surface, with short, inconspicuous bristles on outer surface; with **uncus** moderately long, moderately stout, subequal to width of tibial apex; hind tibiae as strongly arcuate as fore- and midtibiae, with denticles like fore- and midtibiae, with three setae on inner surface. Tarsi moderately short, sublinear; reddish brown; tarsomeres 1-3 slightly widened toward apex; tarsomere 3 not wider at apex than 2, sublinear, subtruncate; tarsomeres ventrally with sparse to dense, subrecumbent to recumbent pubescence, dorsally each with pair of apical dorsal bristles. **Length**, pronotum and elytron: 2.15 mm.

Female. -- Not known.

Genitalia and Associated Structures. -- **MALE.** **Median lobe** with dorsal surface excluding orificial area, fully sclerotized; with ventral surface fully sclerotized; very slightly asymmetrical toward apex; widest at orifice, gradually constricted behind dorsal process; with apex elongate, more or less triangular, apical margin broadly and uniformly rounded, slightly subapically constricted; with apex in lateral view slender, with extreme apex bluntly rounded; with post-orificial dorsal process directed vertically, with **setal** brush situated anteromedially; with dorsal surface behind dorsal process with broad, deep depression, with lateral margin behind dorsal process markedly acute; with dorsal surface behind dorsal process fully and uniformly sclerotized; with dorsobasal margin distinct, deeply emarginate; with ventrobasal margin distinct, deeply emarginate. Orifice triangular, somewhat elongate; with proximal margin concealed by dorsal process. **Apodemes** robust, short, curving strongly inward, 0.11 as long as median lobe. **Internal sac.** Orificial sclerites lacking and without internal sclerites.

Intraspecific Variation. -- Size range 2.15 mm. Known from the holotype only.

Etymological Note. -- This epithet is based on the combination of *B. fractus*, a closely related species of *Bagous* from the same region, and the Latin suffix *-odes* (= like, resembling), and refers to the extremely close resemblance of the morphology of these two species.

Remarks and Comparative Notes. -- This species is most likely to be confused with *B. fractus*, and except for the key characters these are nearly identical. It may also may be confused easily with *B. fritodes*. However, the pronotum of the latter is ca. 3/4 as long as broad and the ventral margin of the rostrum is both subangulate and subcarinate. This species is most similar in genital structure to *B. fractus*, among Japanese species. It is readily distinguishable from that species by the less elongate apex of the median lobe, by the lack of a sublateral angulate margin behind the dorsal process, by the acute lateral margin behind the dorsal

process, and by the lack of ventrobasal carinae.

Biological Notes. -- **No** data are available.

Type Locality. -- Japan, Honshu, Chiba Prefecture, Lake Tega.

Notes on Type Specimen(s). -- Holotype (by designation) male (dissected), with the following labels: 1) [rectangular; white; printed male symbol in black ink] male 2) [rectangular; white; printed in black ink] Lake Tega Chiba pref. 14-VIII-1967 H. Yamazaki 3) [rectangular; pink with black margins; printed in black ink] DRAWN / Askevold 1994 4) [rectangular; red; printed in black ink] HOLOTYPE / Bagous / fractodes / O'Brien & Morimoto, 1994.

Point mounted. Deposited in Kyushu University, Fukuoka, Japan. Type number 2947.

Range. -- Chiba Prefecture, Honshu Japan.

Material **Examined.** -- Holotype only. [JAPAN:] [Honshû:] Lake Tega Chiba pref. 14-VIII-1967 H. Yamazaki (holotype, KU).

Phylogenetic Position. -- The position of this species is not clear. In male genital structure *B. fractodes* is most similar among Japanese species to *B. fractus*, but differs substantially in detail from that species. We do not believe we can be specific about in what known species group this species belongs, but we are not prepared at this time to assign it to a new species group.

***Bagous nipponensis* O'Brien & Morimoto, new species.**

(Figures 5, 6, 9.)

DESCRIPTION. -- **Holotype Female.** -- Body medium-sized, elongate-oval, robust. **Rostrum** moderately long, 0.95 as long as prothorax; black, with apex reddish brown; broadly subcylindrical; with dorsal curvature strong and even; with ventral curvature moderate and even; not more distinctly depressed toward apex; with median basal carina lacking; with basolateral carina lacking; with apicolateral carina lacking; with apical median carina lacking; with basolateral sulcus deep, narrow, long, coarsely punctate; with ventral margin subangulate, not carinate; with sides unevenly subparallel, weakly subquadrately expanded in apical 1/2; scrobe visible from above only at point of insertion, glabrous, reaching eye, dorsal margin reaching eye just above middle, basally with ventral margin straight or almost so, meeting rostral margin at very acute angle; with scales uniformly dense to apex, subgranulate, contiguous, pitted, round, brown, more coarsely subgranulate and pitted basally; with scales not sparser apically, subgranulate, contiguous, finely pitted, round, not metallic; with numerous, widely and uniformly spaced, subrecumbent, evident, curled setae; coarsely densely punctate, with punctures becoming sparser and finer apically. **Head** moderately convex; swelling beside eye lacking; eyes moderately convex, medium sized; with scales coarsely granulate, contiguous, coarsely pitted, round, brown and white; with plumose scales whitish, on articulating area and behind eyes. Supraocular setae few, short, distinct, subrecumbent, curved, coarse, scale like, linearly arranged. Frons without submedian setae; broad, 0.55 as wide as head across eyes, somewhat flattened, not impressed, not set off from rostrum by impression; with median sulcus, sulcus deep, moderately broad, long. **Antennae** inserted at apical 2/5, inserted laterally; scape moderately long, moderately slender, clavate; scape and funicle reddish brown; funicle short, 0.74 as long as scape, with segment 1 stout, segment 2 slender, 1 and 2 subequal in length, 3-6 short, 7 short and strongly transverse; segment 7 narrower than first club segment; with

pubescence of segment 7 distinctly denser than other segments; distinctly separated from club; club broad-oval, uniformly pubescent, segment 1 shorter than segments 2-4, 0.71 as long as funicle, reddish brown. **Pronotum** weakly transverse, 0.87 as long as broad; with sides sinuately subparallel, weakly expanding from base; with apical constriction moderate, in apical 1/8, without longitudinal carinae, dorsally distinct and uniform; laterally moderately rounded behind constriction, with sides slightly impressed behind round area; lacking pit near margin of prosternal sulcus; with median sulcus indistinct, narrow, incomplete, of uniform depth and width or almost so; with median carina lacking; with disc transversely moderately convex, not undulate, not rugose or rugulose; with apical and marginal setae numerous, distinct, short, subrecumbent, curved, coarse; with carina of basal margin lacking; with area of plumose scales of basal declivity broad, convex and distinct; with scales coarsely granulate, coarsely pitted, contiguous and subcontiguous, round, blackish brown; with three vittae, with median vitta narrow, complete, distinct, straight, whitish brown; with lateral vittae broad, curved, pale whitish brown; with indefinite dark brown lateral maculae on disc; with sides whitish brown, with indefinite blackish brown maculae; with postocular lobes strongly developed, not deeply excavated below, reddish brown. **Prosternal sulcus** moderately deep, broad, moderately narrowed at apical constriction, biangulate; with side margins moderately sharply raised, with lateral margin just in front of coxae (lateral view) acute, with lateral margin neither distinctly projecting posterad over forecoxae nor bent inward. **Scutellum** large. **Elytra** subparallel behind humeri to declivity; 1.38 as long as wide across humeri; with disc area flat; with declivity at 60 degrees (in relation to dorsal plane); markedly wider than prothorax; with apices nonacuminate, conjointly moderately emarginate; with humeri well-developed, obliquely angulate, non-acute, somewhat produced; with basal margin more or less flat, at most slightly swollen adjacent to scutellum; with odd-numbered intervals slightly more convex and elevated, broader than even-numbered intervals, with interval 3 more or less uniformly elevated; with setae of odd-numbered intervals conspicuous, short, subrecumbent, curled, coarse, pale, each surrounded by scales of same color as other scales; even-numbered intervals unevenly flattened, interval 2 not impressed; intervals 3-5 on disc slightly sinuately-sided; disc weakly transversely angulately impressed across basal 1/3, disc not undulating; antedeclivital swelling of interval 3 lacking; declivital callus of interval 5 well-developed, subangulate, antedeclivital swelling of 5th interval lacking; confluence of intervals 3 and 9 swollen; striae distinct, moderately deep, broad; with punctures small, elongate, narrow, moderately shallow, not wider than striae grooves; scales granulate, contiguous and imbricate, coarsely pitted, round, arranged irregularly, with three or more scales across intervals, brown, whitish and black; maculate; humeri with macula white; antedeclivital callus or area of interval 3 with macula large, white; declivital callus or area of interval 5 with macula white; otherwise with numerous scattered large whitish brown maculae, side margins and apex mostly whitish brown, remainder blackish; cuticle black. Metathoracic wings fully developed. **Abdominal sterna** with punctures lacking (only granules), scales pitted. Sternum 1 with median impression moderately deep, broad, interrupted (basal and apical), flattened in middle 1/2, impression in apical 1/4, impression in basal 1/4, not deeper apically, slightly narrowed apically, not continued on sternum 2; apical margin not declivous; 1.41 as long as 2; suture between 1 & 2 bisinuate, uniformly deep. Sternum 2 flattened; apical 1/2 steeply declivous, not impressed on declivity; 1.70 as long as 3 & 4 together; with transverse row of scarcely evident (often denuded) subrecumbent coarse setae. Sternum 5 with pair of subbasal

lateral impressions, with apicomedian area flat, basally flat, without tubercles; with lateral impressions very shallow, small; with one pair of apicolateral setae, suberect, coarse; 1.00 as long as 3 & 4 together, 0.71 as long as 2, 0.57 as long as 1. **Meso-** and **metasternum** with punctures not forming large concavities; mesosternal process large, subtriangular between **coxae**; with scales plumose; metasternum 1.OO as long as sternum 1. **Legs** moderately long; femora clavate, reddish brown. Tibiae moderately slender, reddish brown, with inner margin bisinuate, with outer margin moderately arcuate toward apex (in lateral view); with apices not narrowed; with inner surface with denticles few, distinct, stout, foretibiae lacking both large acute denticles or spur, denticles of midtibiae like those of foretibiae; with conspicuous short bristles on inner surface, with short, inconspicuous bristles on outer surface; with **uncus** long, moderately stout, as long as width of tibial apex; hind tibiae as strongly arcuate as fore- and midtibiae, with denticles like fore- and midtibiae, with 3 setae on inner surface. **Tarsi** moderately short, sublinear; reddish black; tarsomeres 1-3 slightly widened toward apex; tarsomere 3 not wider at apex than 2, sublinear, subtruncate; tarsomeres ventrally with sparse to dense, subrecumbent to recumbent pubescence, dorsally each with pair of apical dorsal bristles. **Length**, pronotum and elytron: 2.90 mm.

Male. -- Not known.

Genitalia and Associated Structures. -- **FEMALE.** **Sternum VIII** with apical setae numerous, very short, slender; arms broad, with inner margins more or less straight, slightly apically convergent, with outer margins straight; fenestral area open, oval. **Apodemes** broadly divergent from apical 1/3, narrowly separated to base. **Spermatheca** with ramus indistinct, extending slightly past insertion of spermathecal duct, with outline almost uniformly continuous with body. Nodulus slightly concave and irregularly wrinkled. **Gonocoxae** long, slender, with apex oblique, glabrous apically (or setae not distinguishable); with styli distinct, apicolaterally inserted. **Bursa copulatrix** simple, without sclerites. **Tergum VIII** more or less quadrate; with apical margin medially slightly truncate and somewhat produced medially, narrowly reflexed, forming distinct lip and broad, subapical transverse furrow; apicolaterally angulately swollen, with lateral margins slightly inflexed ventrolaterally. **Pygidium** with apex truncate.

Intraspecific Variation. -- Size range 2.90 mm. Known from the holotype only.

Etymological Note. -- This epithet is based on the combination Nippon (Japan), the country in which the type was collected, and the Latin suffix *-ensis* (indicating origin or place).

Remarks and Comparative Notes. -- This species is likely to be confused with *B. fritodes*. In addition to the characters in the key the latter has the pronotum 3/4 as long as broad. *B. nipponensis* also might be confused with *B. fractus* and *B. fractodes*, both of which are smaller, 2.60 mm or less. This species is most similar in female genital structure to *B. fritodes*, but differs in detail from all species known from Japan.

Biological Notes. -- No data are available.

Type Locality. -- Japan, Honshû, Chiba Prefecture, Lake Tega.

Notes on Type Specimen(s). -- Holotype (by designation) female (dissected), with the following labels: 1) [rectangular; white; printed female symbol in black ink] female 2) [rectangular; white; printed in black ink] Lake Tega Chiba pref. 5-VI-1967 H. Yamazaki 3) [rectangular; pink with black margins; printed in black ink] DRAWN / Askevold 1994 4) [rectangular; red; printed in black ink] HOLOTYPE / Bagous / nipponensis / O'Brien & Morimoto, 1994.

Point mounted. Right front leg attached to point mount. Left middle leg and both hind legs missing some tarsomeres. Deposited in Kyushu University, Fukuoka, Japan. Type number 2948.

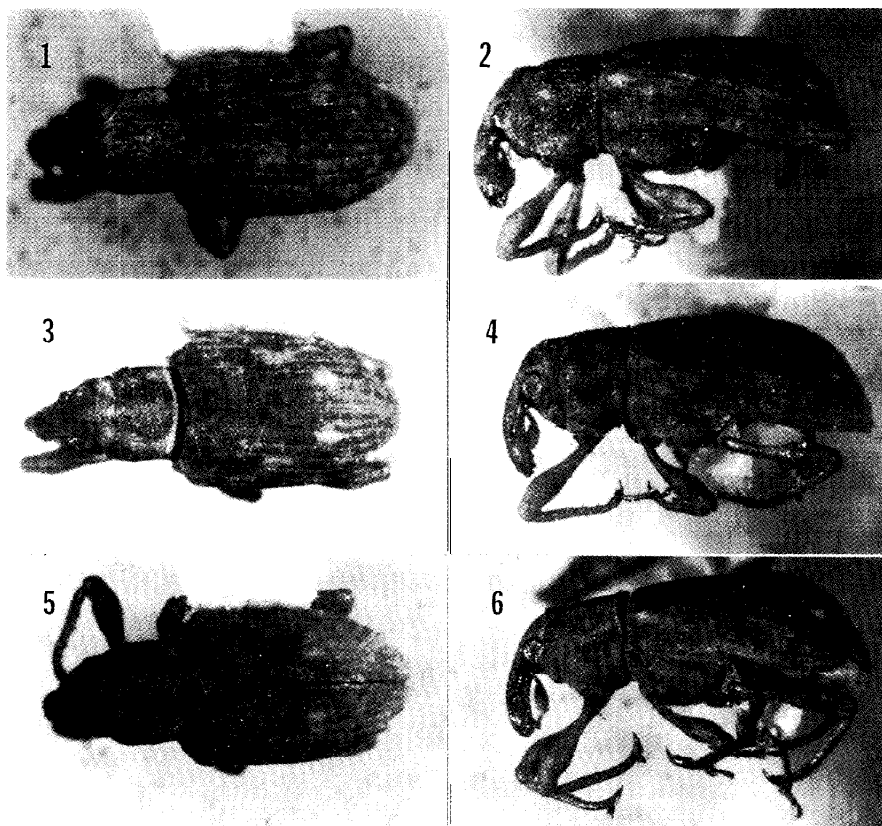
Range. -- Chiba Prefecture, Honshû Japan.

Material Examined. -- Holotype only. [JAPAN:] [Honshû:] Lake Tega Chiba pref. 5-VI-1967 H. Yamazaki (holotype, KU).

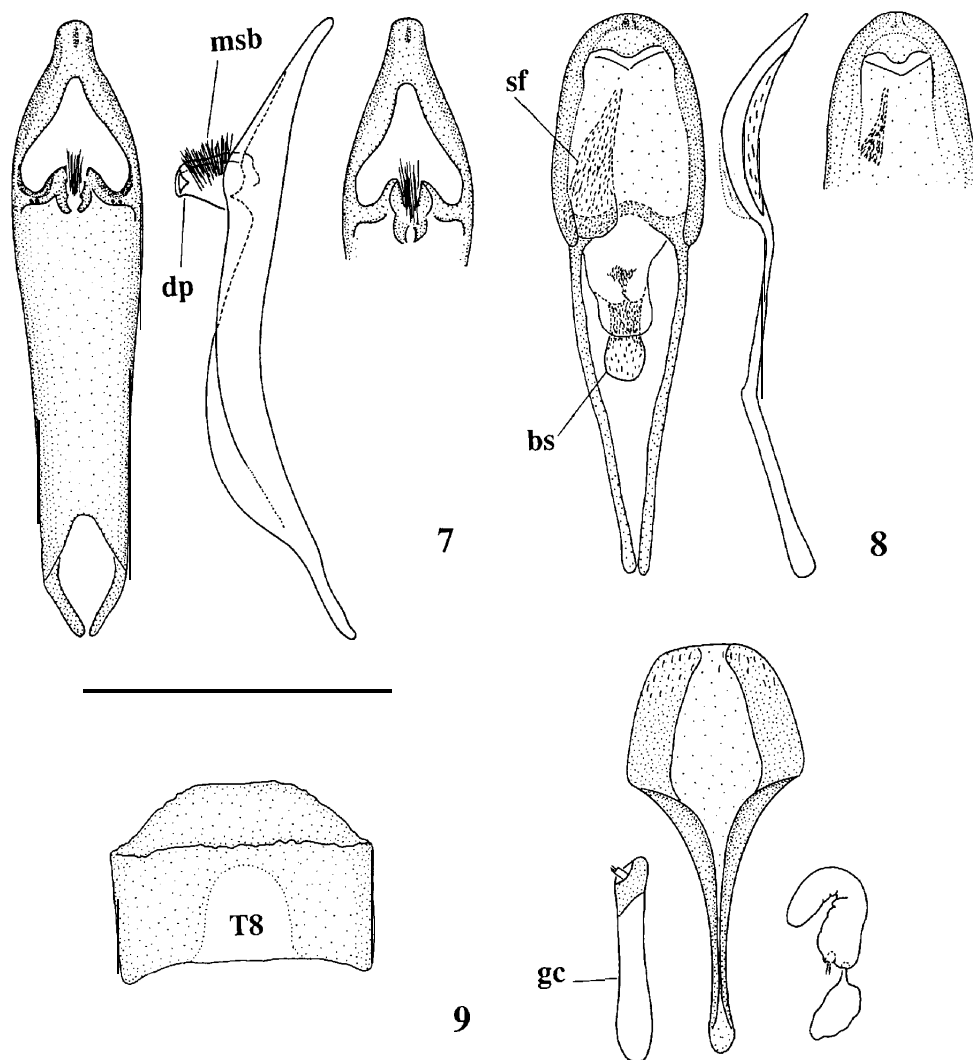
Phylogenetic Position. -- The position of this species is equivocal because no male is known. However, we believe that it must be a species that possesses a dorsal process of the median lobe, as evidenced by the structure of tergum VIII. Among species that have a dorsal process, this tergum of females generally has the apicolateral angle acute, or even produced and somewhat carinate between these angles to produce a broad apical furrow, the ventrolateral margin is inflexed below, and the apical margin is produced into a distinct lip (see Fig. 9). Species lacking a dorsal process of the median lobe do not possess such a tergum VIII.

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Figures 1-6. Habitus photos of Japanese *Bagous*. 1-2, *B. yamazakii*; 3-4, *B. fractodes*; 5-6, *B. nipponensis*.



Figures 7-9. Genitalia of Japanese *Bagous*. 7, median lobe of *B. fractodes*, dorsal, lateral and apical views; 8, median lobe of *B. yamazakii*, dorsal, lateral and apical views; 9, female genitalia of *B. nipponensis*, tergum VIII, gonocoxa, sternum VIII, and spermatheca. Abbreviations: **bs** = basal spiculate sacule; **dp** = dorsal process; **gc** = gonocoxa; **msb** = median setal brush; **sf** = spiculate field; **T8** = tergum VIII. Scale bar = 0.5 mm.