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Studies on Scolytidae XI

Scolytus GEOFFROY of Japan (Coleoptera)

by

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Summary : Twelve species of the Japanese *Scolytus* are recognized. A new species, *S. aomoriensis* are described. A name *S. betulae* NIIJIMA is placed in synonymy with *S. chikisanii* NIIJIMA. A lecotype for *S. chikisanii* NIIJIMA is designated. A key to all species, notes on geographical distribution, and host plants are included.

Introduction

The genus *Scolytus* GEOFFROY is widely distributed in the world, and mostly in the Holarctic realm. Thirteen species have been recorded from Japan[2)4)8)10)11)12)15)]. All of the Japanese species breed in the inner bark of broad leaved trees of the genera *Carpinus, Betula, Ulmus, Zelkova, Prunus,* etc., and are monogamous bark beetles.

Adults are readily distinguished from other bark beetles by the seven segmented funicles of the antennae, by the prominent curved process in the outer distal angle of the anterior tibiae, by the smooth and shining pronotum, by the not declivitous elytra, by the ascending venter of the abdomen, and by the structures of the male genitalia and the proventriculus.

The breeding habits of *Scolytus* spp. do not differ greatly from those of many other monogamous bark beetles. Adult beetles bore an egg gallery into the bark. The egg gallery always runs parallel to the grain of the wood, with the exception of *S. claviger*. The eggs are laid in small niches along the sides of the egg gallery. The larva mines extend out from the egg gallery. The pupal chambers are formed at the end of the larval tunnels, and when the adults mature they bore circular holes in the bark through which they escape. Many species usually breed only in dying, cut, or weakened trees, but *S. japonicus* and *S. ussuriensis* attack healthy branches of *Prunus*. Some species are said to be important vectors of the Dutch elm disease in North America and Europe.

This study is based on an examination of one thousand and thirty-five specimens. The specimens used in this study are deposited in the Government Forest Experiment Station.

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Genus *Scolytus* Geoffroy

Scolytus Geoffroy, 1762, Histoire abrégèe insectes, 1 : 305; Müller, 1764, Fauna Insectorum Fridrichsdalina, p. 14; Thomson, 1859, Skandinaviens Coleoptera, 1 : 147; Eichhoff, 1864, Berl. ent. Z., 8 : 31; Thomson, 1865, Skandinaviens Coleoptera, 7 : 372; Chapuis, 1873, Synopsis des Scolytides, p. 261; Leconte, 1876, Proc. Amer. Philos. Soc., 1876 : 370; Eichhoff, 1881, Die europäischen Borkenkäfer, p. 148; Bedel, 1888, Faune des Coléoptères du bassin de la Seine, 6 : 386, 405; Reitter, 1894, Bestimmungstabelle der Borkenkäfer, p. 39; Blandford, 1894, Trans. Ent. Soc. London, 1894 : 77; Blandford, 1895, Biol. Cent. Amer. Col., 4 : 120; Barbey, 1901, Les Scolytides de l'Europe centrale, p. 34; Niijima, 1909, Jour. Coll. Agr., Tohoku Imp. Univ., 3 : 116; Reitter, 1913, Bestimmungstabelle der Borkenkäfer, p. 13; Hopkins, 1915, U. S. Dep. Agr. Bur. Ent., Tech. Ser., 17 (2) : 219; Spessivtseff, 1925, Svensk Insektenfauna, Scolytidae, p. 151; Munro, 1926, For. Comm. Bull., 8 : 44; Butovitsch, 1929, Stettin. ent. Ztg., 90; 1; Murayama, 1930, Jour. Chôsen Nat. Hist. Soc., 11 : 9; Schedl, 1932, Catalogus Coleopterorum regionis palaearcticae, F. 1632; Blackman, 1934, U. S. Dept. Agr., Techn. Bull., 434 : 1～30, Dodge, 1938, Univ. Minnesota Tech. Bull., 132 : 20; Kurenzov, 1941, Короеды Дальнего Востока СССР, p. 105; Niijima, 1943, Trans. Sapporo Nat. Hist. Soc., 17 : 140; Balachowsky, 1944, Ann. Ecole nat. Agr. Grignon, 3 (4) : 1～26; Beal et Massey, 1945, Duke Univ. School For. Bull., 10 : 66; Schedl, 1948, Zbl. Gesamtgeb. Ent., 1 : 1～66; Dammerman, 1950, Ent. Ber., 13 : 12; Stark, 1952, Фауна СССР, 31 : 85; Duffy, 1953, Handbook for the identification of British insect, Scolytidae and Platypodidae, p. 10; Murayama, 1953, Trans. Shikoku Ent. Soc., 3 : 147; Murayama, 1953, Bull. Fac. Agr. Yamaguti Univ., 4 : 4; Nunberg, 1954, Klucze do oznaczania owadów Polski, 19 (99～100) : 99; Pfeffer, 1955, Fauna ČSR, 6 : 70; Krivolutzkaja, 1958, Короеды Острова Сахалина, p. 108.

Eccoptogaster Herbst, 1793, Natursystem aller bekannten in- und ausländischen Insekten, 5 : 124; Erichson, 1836, Arch. Naturg., 2 : 53; Ratzeburg, 1837, Die Forstinsekten, 1 : 168; Trédl, 1907, Ent. Blätt., 3 : 5; Hagedorn, 1910, Coleopterorum Catalogus, 4 : 82; Hagedorn, 1910, Genera Insectorum, 111 : 122; Hopkins, 1914, Proc. U. S. Nat. Mus., 48 (2066) : 121; Swaine, 1918, Canadian bark beetles, 2 : 39; Blackman, Missisippi Agr. Exp. Sta., Tech. Bull., 11 : 41.

Ruguloscolytus Butovitsch, 1929, Stettin. ent. Ztg., 90 : 49; Schedl, 1932, Catalogus Coleopterorum regionis palaearcticae, F. 1632; Balachowsky, 1949, Faune de France, 50 : 54; Stark, 1952, Фауна СССР, 31 : 86, 94.

Archaeoscolytus Butovitsch, 1929, Stettin. ent. Ztg., 90 : 23; Stark, 1952, Фауна СССР, 31 : 86.

Tubuloscolytus Butovitsch, 1929, Stettin. ent. Ztg., 90 : 33; Stark, 1952, Фауна СССР, 31 : 92.

Type species : —*Bostrichus scolytus* Fabricius

Key to the Species

1. Second abdominal segment with a strong and robust process in male, and a short and pointed tubercle in female; body length 3.4～5.2 mm. ..... *S. claviger* Blandford
– Second abdominal segment unarmed with process or tubercle. 2
2. Third abdominal segment with a long flattened process; body length 3.0～5.0 mm. ..... *S. jacobsoni* Spessivtseff ♂

– Third abdominal segment unarmed with process. ····· 3
3. Posterior margin of first abdominal segment strongly elevated or carinate. ····· 4
– Posterior margin of first abdominal segment not or feebly elevated. ····· 9
4. Elytral striae impressed; frons irregularly covered with straight hairs or glabrous. ····· 5
– Elytral striae not or slightly impressed; frons with longer, incurved hairs from periphery; alternate interstriae with a irregular row of punctures; body length 3.6～4.3 mm. ····· ····· *S. frontalis* Blandford
5. Frons with a median longitudinal carina, which is short and distinct in female, and rather weak and extending from epistoma to upper level of eyes in male; body length 4.5～6.5 mm. ····· *S. ratzeburgi* Janson
– Frons without longitudinal carina in both sexes. ····· 6
6. Interstriae of elytra with a single row of punctures; abdominal segment unarmed tubercles; body length 3.0～5.0 mm. ····· *S. jacobsoni* Spessivtseff ♀
– Third interstriae of elytra with double rows of punctures from base to apex or at base; abdomen usually with a tubercle in each posterior margin of third and fourth segments. ····· 7
7. Fourth interstriae with irregular double rows of punctures as those on third interstriae; body length 6.3 mm. ····· *S. aomoriensis* Nobuchi (sp. nov.)
– Fourth interstriae with single row of punctures. ····· 8
8. Third interstriae wider than fourth in middle, with double rows of punctures from base to apex; in larger species, fifth interstriae with double rows of punctures; body length 2.8～5.5 mm. ····· *S. esuriens* Blandford
– Third interstriae as wide as fourth in middle; second and third interstriae irregularly punctured on basal portion; body length 2.5～3.7 mm. ····· *S. chikisanii* Nijima
9. Third and fourth abdominal segments with a transverse series of hairs; in male, frons very densely covered with yellowish decumbent scales; body length 2.5～3.4 mm. ····· ····· *S. ellipticus* Murayama
– Abdominal segment irregularly covered with short hairs; frons without decumbent scales. ····· 10
10. Body large (4.0～7.0 mm.); apical margin of elytra minutely serrate at near suture; fifth abdominal segment with a pair of close tufts of long golden hairs in male. ····· ····· *S. dahuricus* Chapuis
– Body smaller than 3.5 mm. ····· 11
11. Elytra reddish brown; frons sparsely covered with hairs on anterior portion in male; fifth abdominal segment not recurved at apex and with a pair of tufts of long hairs on rather distinct elevation in male; body length 2.0～3.0 mm. ····· *S. aratus* Blandford
– Elytra black; frons with hairs or scale-like hairs in middle; fifth abdominal segment recurved at apex and without tuft of hairs. ····· 12
12. Body larger than 2.5 mm.; fifth abdominal segment sparsely setigerous and with short hairs in middle and a few long hairs on lateral sides of apical margin; body length 2.5 mm. ····· *S. japonicus* Chapuis
– Body smaller than 2.0 mm.; fifth abdominal segment very densely covered with short decumbent hairs at apex; body length 1.8～2.0 mm. ····· *S. ussuriensis* Kurenzov

Scolytus aomoriensis Nobuchi sp. nov.

Oblong, roundly narrowing anteriorly and posteriorly; black, shining, mouth-parts (except mandibles), and antennae yellowish brown, anterior margin of pronotum, scutellum, elytra, tibiae, tarsus, middle of first abdominal segment, and posterior margins of second and third abdominal segment reddish brown. Body beneath rather densely setigerous.

Frons slightly convex, impressed over mouth, with a weak lunate impression on upper portion, sparsely setigerous, with long aciculate scratches, which are replaced by granules at front of eyes. Antennal funicles seven-segmented, clubs similar to those of *S. esuriens*. Pronotum wider than long (4.4 : 4.0), widened at base, basal margin strongly bisinuate, narrowly marginate, lateral sides narrowly rounded anteriorly, constricted anteriorly, lateral margins less weakly marginate than *S. esuriens*, anterior margin strongly rounded but slightly emarginate in middle; disk strongly convex shining, less finely punctured in middle of basal area than *S. esuriens*, the punctures becoming closer and larger on lateral and anterior sides, with an impunctate median line from base to middle, lateral sides sparsely covered with yellowish hairs. Scutellum nearly triangular, convex, closely rugose. Elytra nearly as wide as base of pronotum, 1.15 times as wide as long, basal margin oblique, lateral sides almost parallel in basal half of elytral length and thence roundly narrowing posteriorly, apical margin slightly rounded and not serrate; upper surface convex, each side of suture strongly impressed in basal half, humeral callosities elevated, striae narrow and distinctly impressed, with rather close but small punctures, interstriae elevated and very wide, with irregular double rows of punctures, first interstriae narrower, with uniserial row of punctures, lateral sides closely covered with large punctures, apical portion closely and distinctly punctured, and very sparsely setigerous. Abdomen concave, distinctly punctured, first abdominal segment distinctly elevated in middle, marginate in posterior margin, third and fourth with a weak tubercle in each posterior margin, fifth impressed on posterior area and marginate in posterior margin.

Body length : —6.3 mm.

Holotype : —A female, Aburakawa, Aomori, Sept. 10, 1943, T. Kishii leg.

This species is allied to *S. esuriens* Blandford, but may be distinguished by the larger body and by the irregular double rows of punctures on the fourth interstriae of the elytra.

Host : —Unknown.

Distribution : —Japan (Honshu).

Japanese name : —Aomori-kikuimushi.

Scolytus aratus Blandford

Scolytus aratus Blandford, 1894, Trans. Ent. Soc. London, 1894 : 79; Niijima, 1905, Jour. Sapporo Agr. Coll., 2 : 73; Niijima, 1909, Jour. Coll. Agr., Tohoku Imp. Univ., 3 : 120; Niijima, 1910, Trans. Sapporo Nat. Hist. Soc., 3 : 6; Niijima, 1913, Forest entomology, p. 124; Kurenzov, 1941, Короеды Дальнего Востока СССР, p. 81; Schedl, 1948, Zbl. Gesamtgeb. Ent., 1 : 33; Niijima, 1950, Iconographia Insectorum Japonicorum, p. 1289; Murayama, 1954, Bull. Fac. Agr. Yamaguti Univ., 5 : 154; Murayama, 1955, Ibid., 6 : 103; Kabe, 1955, Studies on the galleries of bark-beetles and ambrosia-beetles in Japan, p. 90; Krivolutzkaja, 1958, Короеды Острова Сахалина, p. 110; Kabe, 1959, Nipponsan Kikuimushirui Shokkon Zusetsu, p. 58; Kabe, 1960, On the

hosts and habits of the Scolytid and Platypodid beetles in Japan, p. 2; Murayama, 1961, Akitu, 10 : 23; Murayama, 1965, Scolytid beetles from Niigata Prefecture, Japan II, p. 4; Krivolutzkaja, 1965, Фауна Короедов Южных Курильских Островов, p. 227.

Eccoptogaster aratus : Hagedorn, 1910, Coleopterorum Catalogus, 4 : 83; Hagedorn, 1910, Genera Insectorum, 111 : 123.

Scolytus (s. str.) *aratus* : Butovitsch, 1929, Stettin. ent. Ztg., 90 : 42; Schedl, 1932, Catalogus Coleopterorum regionis palaearticae, F. 1633; Stark, 1952, Фауна СССР, 31 : 127.

Scolytus aequipunctatus Nijima, 1905, Jour. Sapporo Agr. Coll., 2 : 71.

Eccoptogaster aequipunctatus : Hagedorn, 1910, Coleopterorum Catalogus, 4 : 83.

Scolytus aratus var. *aequipunctatus* : Nijima, 1909, Jour. Coll. Agr., Tohoku Imp. Univ., 3 : 121.

Eccoptogaster aratus var. *aequipunctatus* : Hagedorn, 1910, Genera Insectorum, 111 : 123.

Scolytus (s. str.) *aratus* ab. *aequipunctatus* : Schedl, 1932, Catalogus Coleopterorum regionis palaearcticae, F. 1633; Stark, 1952, Фауна СССР, 31 : 127.

Scolytus brevipennis : Kurenzov, 1935, Короеды Южного Сихотэ-Алиня, 11 : 22; Kurenzov, 1941, Короеды Дальнего Востока СССР, p. 100; Stark, 1952, Фауна СССР, 31 : 143; Sokanovsky, 1954, Byull. Mosk. Obshch. Isp. Prir., 59 : 14.

This species is easily distinguished from other Japanese representatives of *Scolytus* by the characters as given in the key. The specimens recorded by Nijima (1905～1913) were preserved in the Government Forest Experiment Station, but I have not seen any other specimen collected in Japan.

Type locality : —Junsai.

Hosts : —*Machilus japonica* Sieb. et Zucc., *Prunus mume* Sieb. et Zucc., *P. pseudo-cerasus* Lindl., *Malus pumila* Miller var. *domestica* Schneider, and *Sorbus commixta* Hedl.

Gallery : —Simple longitudinal tunnel (Nijima, 1913).

Distribution : —Japan (Hokkaido and Honshu), Saghalien, Kuril, and Siberia.

Japanese name : —Umeno-kikuimushi (Mumeno-kikuimushi).

Scolytus chikisanii Nijima

Scolytus chikisanii Nijima, 1905, Jour. Sapporo Agr. Coll., 2 : 69; Nijima, 1909, Jour. Coll. Agr., Tohoku Imp. Univ., 3 : 118; Nijima, 1913, Forest entomology, p. 123; Schedl, 1948, Zbl. Gesamtgeb. Ent., 1 : 42; Inouye, 1953, A detailed book of the forest insect control, 2 : 156; Kabe, 1955, Studies on the galleries of bark-beetles and ambrosia-beetles in Japan, p. 63; Kabe, 1959, Nipponsan Kikuimushirui Shokkon Zusetsu, p. 60; Kabe, 1960, On the hosts of the Scolytid and Platypodid beetles in Japan, p. 2.

Eccoptogaster chikisanii : Hagedorn, 1910, Coleopterorum Catalogus, 4 : 84; Hagedorn, 1910, Genera Insectorum, 111 : 123.

Scolytus (s. str.) *chikisanii* : Schedl, 1932, Catalogus Coleopterorum regionis palaearcticae, F. 1633.

Scolytus (s. str.) *Shikisanii* : Stark, 1952, Фауна СССР, 31 : 114.

Scolytus shikisanii : Kurenzov, 1941, Короеды Дальнего Востока СССР, p. 85; Sokanovsky, 1954, Byull. mosk. Obshch. Isp. Prir., 59 : 14; Krivolutzkaja, 1958, Короеды Острова Сахалина, p. 110; Krivolutzkaja, 1965, Фауна Короедов Южных Курильских Островов, p. 225.

Scolytus curviventralis Nijima, 1905, Jour. Sapporo Agr. Coll., 2 : 70; Nijima, 1909, Jour. Coll. Agr., Tohoku Imp. Univ., 3 : 119; Murayama, 1936, Tenthredo, 1 : 122; Murayama, 1940, Ann.

Zool. Japon., 19 : 230; KURENZOV, 1941, Короеды Дальнего Востока СССР, p. 86; SCHEDL, 1948, Zbl. Gesamtgeb. Ent., 1 : 42; INOUYE, 1953, A detailed book of the forest insect control, 2 : 161; MURAYAMA, 1954, Bull. Fac. Agr. Yamaguti Univ., 5 : 154; KABE, 1959, Nipponsan Kikuimushirui Shokkon Zusetsu, p. 62; KABE, 1960, On the hosts and habits of the Scolytid and Platypodid beetles in Japan, p. 31.

Eccoptogaster curviventralis : HAGEDORN, 1910, Coleopterorum Catalogus, 4 : 84; HAGEDORN, 1910, Genera Insectorum, 111 : 123.

Scolytus (s. str.) *curviventralis* : SCHEDL, 1932, Catalogus Coleopterorum regionis palaearcticae, F. 1633.

Scolytus betulae NIIJIMA, 1943, Trans. Sapporo Nat. Hist. Soc., 17 : 141 (syn. nov.).

This species is allied to *S. esuriens* BLANDFORD, but is readily distinguished by the more distinct strial punctures, by the larger punctures on the pronotum, and by the weaker emargination in the posterior margin of the elytra.

Five specimens are in the type series and labeled as "*Scolytus chikisanii* NIIJIMA, Type" in the NIIJIMA collection. The female type is chosen as the lecotype. Adding to the original description, the type series and other specimens in our collection have irregular rows of punctures on the basal area of the second and third interstiae on the elytra.

According to my study on the type specimens of *S. curviventralis* NIIJIMA, this species is identical with *S. chikisanii* NIIJIMA by having the strongly concave venter of the abdomen.

The type series of four specimens of *S. betulae* were compared to the type specimens of this species. These specimens were not found to have any distinct character which may separate the two species. In the original description of *S. betulae*, NIIJIMA mentioned a character of fifth abdominal segment, but it may be regarded as the sexual variation.

Type localities : —Sapporo and Mt. Moiwa.

Hosts : —*Betula platyphylla* SUKATCHEV var. *japonica* HARA and *Ulmus davidiana* PLANCHON var. *japonica* (REHD.) NAKAI.

Gallery : —Simple longitudinal tunnel.

Distribution : —Japan (Hokkaido and Honshu), Saghalien, Kuril, Siberia, and China (North East).

Specimens from the following localities were examined. Hokkaido : Ichinohashi, Nishiokkope, Asahikawa, Sounkyo, Onneyu, Shokotsu, Sapporo, Nopporo, Mt. Moiwa, Kotoni, Zyozankei, Hôheikyo, and Fukinodai. Fukushima : Hinoemata. Nagano : Morigami. Mie : Hirakura. Tottori : Mt. Daisen.

Japanese name : Nireno-kikuimushi (Nirenokuro-kikuimushi).

Scolytus claviger BLANDFORD

Scolytus claviger BLANDFORD, 1894, Trans. Ent. Soc. London, 1894 : 80; NIIJIMA, 1909, Jour. Coll. Agr., Tohoku Imp. Univ., 3 : 122; NIIJIMA, 1913, Forest entomology, p. 126; MURAYAMA, 1930, Jour. Chôsen Nat. Hist. Soc., 11: 9; MURAYAMA, 1934, Ann. Zool. Japon., 14: 298; MURAYAMA, 1937, Tenthredo, 1 : 374; KURENZOV, 1941, Короеды Дальнего Востока СССР, p. 77; SCHEDL, 1948, Zbl. Gesamtgeb. Ent., 1 : 58; INOUYE, 1953, A detailed book of the forest insect control, 2 : 161; MURAYAMA, 1954, Bull. Fac. Agr. Yamaguti Univ., 5 : 154; KABE, 1955, Studies on the galleries of bark-beetles and ambrosia-beetles in Japan, p. 73; KABE, 1959, Nipponsan Kikuimushirui Shokkon Zusetsu, p. 62; KABE, 1960, On the hosts and habits of the Scolytid and

Platypodid beetles in Japan, p. 3; Murayama, 1961, Publ. Ent. Labr., Univ. Osaka Pref., 6 : 93; Murayama, 1965, Scolytid beetles from Niigata Prefecture, Japan II, p. 4.

Eccoptogaster claviger : Hagedorn, 1910, Coleopterorum Catalogus, 4 : 84; Hagedorn, 1910, Genera Insectorum, 111 : 123.

Scolytus (s. str.) *claviger* : Butovitsch, 1929, Stettin. ent. Ztg., 90 : 23; Schedl, 1932, Catalogus Coleopterorum regionis palaearcticae, F. 1632.

Scolytus (*Archaeoscolytus*) *claviger* : Stark, 1952, Фауна СССР, 31 : 95.

Eccoptogaster platystylus Wichmann, 1915, Ent. Blätt., 11 : 213; Sokanovsky, 1954, Byull. mosk. Obshch. Isp. Prir., 59 : 14.

This species is easily distinguished from other Japanese representatives of the genus by a distinct process on the second abdominal segment.

Type locality : —Kiga.

Hosts : —*Carpinus laxiflora* Blume, *C. japonica* Blume, and *C. cordata* Blume.

Gallery : —Simple transverse tunnel.

Distribution : —Japan (Hokkaido, Honshu, and Kyushu), Korea, Siberia, and China (North East).

Specimens from the following localities were examined. Hokkaido : Moiwa. Gunma : Mt. Mikuni. Tokyo : Nippara. Korea : Koryori.

Japanese name : Sawashibano-kikuimushi.

Scolytus dahuricus Chapuis

Scolytus dahuricus Chapuis, 1873, Mém. Soc. R. Sci. Liège, 2 (3) : 268; Reitter, 1894, Bestimmungstabelle der Borkenkäfer, p. 42; Reitter, 1913, Ibid., p. 21; Eggers, 1922, Ent. Blätt., 18 : 116; Schedl, 1932, Catalogus Coleopterorum regionis palaearcticae, F. 1633; Kurenzov, 1941, Короеды Дальнего Востока СССР, p. 79; Nijima, 1943, Trans. Sapporo Nat. Hist. Soc., 17:142; Schedl, 1948, Zbl. Gesamtgeb. Ent., 1 : 34; Stark, 1952, Фауна СССР, 31 : 133; Inouye, 1953, A detailed book of the forest insect control, 2 : 161; Murayama, 1954, Bull. Fac. Agr. Yamaguti Univ., 5 : 154; Kabe, 1955, Studies on the galleries of bark-beetles and ambrosia-beetles in Japan, p. 61; Krivolutzkaja, 1958, Короеды Острова Сахалина, p. 109; Kabe, 1959, Nipponsan Kikuimushirui Shokkon Zusetsu, p. 64; Kabe, 1960, On the hosts and habits of the Scolytid and Platypodid beetles in Japan, p. 3.

Scolytus agnatus Blandford, 1894, Trans. Ent. Soc. London, 1894 : 78; Nijima, 1909, Jour. Coll. Agr., Tohoku Imp. Univ., 3 : 119; Nijima, 1910, Trans. Sapporo Nat. Hist. Soc., 3 : 2; Nijima, 1913, Forest entomology, p. 124; Schedl, 1932, Catalogus Coleopterorum regionis palaearcticae, F. 1632; Schedl, 1948, Zbl. Gesamtgeb. Ent., 1 : 28.

Eccoptogaster dahuricus : Hagedorn, 1910, Coleopterorum Catalogus, 4 : 84; Hagedorn, 1910, Genera Insectorum, 111 : 123; Hagedorn, 1922, Ent. Blätt., 18 : 116.

Eccoptogaster agnatus : Hagedorn, 1910, Coleopterorum Catalogus, 4 : 84; Hagedorn, 1910, Genera Insectorum, 111 : 123.

Scolytus (*Tubuloscolytus*) *dahuricus* : Butovitsch, 1929, Stettin. ent. Ztg., 90 : 7.

Scolytus (*Tubuloscolytus*) *possyet* Stark, 1934, Bull. East. Branch Acad. Sci. USSR, 1934 : 129; Stark, 1952, Фауна СССР, 31 : 134.

This species is apparently closely related to *S. esuriens* Blandford and *S. chikisanii* Nijima, but is distinguished by having a close tuft on each lateral elevation of the fifth abdominal

segment in the male, by a not elevated posterior margin of the first abdominal segment, and by the minutely serrate posterior margin.

Type locality : —Siberia, Daourie.

Hosts : —*Betula platyphylla* Sukatchev var. *japonica* Hara, *B. ermani* Cham., and *Machilus thunbergii* Sieb. et Zucc.

Gallery : —Simple longitudinal tunnel.

Distribution : —Japan (Hokkaido and Honshu), and Saghalien.

Specimens from the following localities were examined. Hokkaido : Otoineppu, Kitami, Antaroma, Sapporo, Kotoni, and Hôheikyo.

Japanese name : —Shirakabano-kikuimushi (Dahuria-kikuimushi).

Scolytus ellipticus Murayama

Scolytus ellipticus Murayama, 1958, Bull. Fac. Agr. Yamaguti Univ., 9 : 929; Kabe, 1959, Nipponsan Kikuimushirui Shokkon Zusetsu, p. 66; Kabe, 1960, On the hosts and habits of the Scolytid and Platypodid beetles in Japan, p. 4.

This species is readily distinguished from other species of this genus in Japan by the characters mentioned in the key.

Type locality : —Onino-oshidashi, Gunma.

Hosts : —*Carpinus japonicus* Blume, *Prunus mume* Sieb. et Zucc., *Prunus* sp. (Cherry), and *Sorbus commixta* Hedl.

Gallery : —Simple longitudinal tunnel.

Distribution : —Japan (Hokkaido and Honshu).

Specimens from the following localities were examined. Hokkaido : Ponpinai. Iwate : Hayachine. Akita : Obonai. Yamanashi : Kinpû.

Japanese name : —Asamayama-kikuimushi.

Scolytus esuriens Blandford

Scolytus esuriens Blandford, 1894, Trans. Ent. Soc. London, 1894 : 77; Niijima, 1905, Jour. Sapporo Agr. Coll., 2 : 68; Niijima, 1909, Jour. Coll. Agr., Tohoku Imp. Univ., 3 : 117; Niijima, 1913, Forest entomology, p. 121; Murayama, 1936, Tenthredo, 1 : 122; Kurenzov, 1941, Короеды Дальнего Востока СССР, p. 87; Schedl, 1948, Zbl. Gesamtgeb. Ent., 1 : 44; Inouye, 1953, A detailed book of the forest insect control, 2 : 158; Murayama, 1954, Bull. Fac. Agr. Yamaguti Univ., 5 : 155; Kabe, 1955, Studies on the galleries of bark-beetles and ambrosia-beetles in Japan, p. 66; Kabe, 1959, Nipponsan Kikuimushirui Shokkon Zusetsu, p. 66; Kabe, 1960, On the hosts and habits of the Scolytid and Platypodid beetles in Japan, p. 3; Nakane, Ohbayashi, Nomura, et Kurosawa, 1963, Iconographia Insectorum Japonicorum, 2 : 381.

Scolytus trispinosus Strohmeyer, 1908, Ent. Wochenbl., p. 69; Niijima, 1909, Jour. Coll. Agr., Tohoku Imp. Univ., 3 : 118; Schedl, 1932, Catalogus Coleopterorum regionis palaearcticae, F. 1633; Murayama, 1936, Tenthredo, 1 : 122; Kurenzov, 1941, Короеды Дальнего Востока СССР, p. 60; Inouye, 1953, A detailed book of the forest insect control, 2 : 161; Krivolutzkaja, 1958, Короеды Острова Сахалина, p. 111; Krivolutzkaja, 1965, Фауна Короедов Южных Курильских Островов, p. 226.

Eccoptogaster esuriens : Hagedorn, 1910, Coleopterorum Catalogus, 4 : 84; Hagedorn, 1910, Genera Insectorum, p. 123.

Eccoptogaster trispinosus : Hagedorn, 1910, Coleopterorum Catalogus, 4 : 89; Hagedorn, 1910, Genera Insectorum, 111 : 124.

Scolytus grandis Kurenzov, 1941, Короеды Дальнего Востока СССР, pp. 104 : 227; Sokanovsky, 1954, Byull. mosk. Obshch. Isp. Prir., 59 : 14.

Scolytus (s. str.) *esuriens* : Schedl, 1932, Catalogus Coleopterorum regionis palaearcticae, F. 1633; Stark, 1952, Фауна СССР, 31 : 113.

Scolytus (s. str.) *trispinosus* : Stark, 1952, Фауна СССР, 31 : 126.

This species is closely related to *S. chikisanii* Nijima, but is readily distinguished by the closer hairs on the frons and having three tufts of golden hairs on the porterior margin of the fifth abdominal segment in the male, by the wider third interstriae, and by the narrower striae on the elytra.

Type localities : —Junsai, Miyanoshita, and Chujenzi.

Hosts : —*Pterocarya rhoifolia* Sieb. et Zucc., *Betula platyphylla* Sukatchev var. *japonica* Hara, *Ulmus davidiana* Planchon var. *japonica* (Rehd.) Nakai, and *Tilia maximowicziana* Shirasawa.

Gallery : —Simple longitudinal tunnel.

Distribution : —Japan (Hokkaido and Honshu) Kuril, and Siberia.

Specimens from the following localities were examined. Hokkaido : Nemuro, Rausu, Tokachi, Nokkeushi, Ebetsu, Nopporo, Sapporo, Moiwa, Maruyama, Hôheikyo, Zyozankei, Kotoni, and Fukinodai. Akita : Hatonoyu. Fukushima : Hinoemata. Nagano : Tokugôtoge and Nidoage.

Japanese name : —Nireno-ohokikuimushi (Mitsuhari-kikui, Shirakabano-kikuimushi).

Scolytus frontalis Blandford

Scolytus frontalis Blandford, 1894, Trans. Ent. Soc. London, 1894 : 79; Nijima, 1909, Jour. Sapporo Agr. Coll., 3 : 119; Nijima, 1910, Trans. Sapporo Nat. Hist. Soc., 3 : 5; Strohmeyer, 1914, Ent. Blätt., 10: 32; Murayama, 1934, Ann. Zool. Japon., 14: 298; Schedl, 1948, Zbl. Gesamtgeb. Ent., 1 : 126; Inouye, 1953, A detailed book of the forest insect control, 2 : 161; Murayama, 1953, Trans. Shikoku Ent. Soc., 3 : 144, 147; Murayama, 1953, Bull. Fac. Agr. Yamaguti Univ., 4 : 4; Murayama, 1954, Ibid., 5 : 155; Murayama, 1955, Ibid., 6 : 101; Kabe, 1955, Studies on the galleries of bark-beetles and ambrosia-beetles in Japan, p. 64; Kabe, 1959, Nipponsan Kikui-mushirui Shokkon Zusetsu, p. 68; Kabe, 1960, On the hosts and habits of the Scolytid and Platypodid beetles in Japan, p. 4; Murayama, 1961, Akitu, 10 : 23; Murayama, 1961, Publ. Ent. Labr., Univ. Osaka Pref., 6 : 93; Nakane, Ohbayashi, Nomura, et Kurosawa, 1963, Iconographia Insectorum Japonicum, 2 : 381; Murayama, 1965, Scolytid beetles from Niigata Prefecture, Japan II, p. 4.

Eccoptogaster frontalis Hagedorn, 1910, Coleopterorum Catalogus, 4 : 84; Hagedorn, 1910, Genera Insectorum, 111 : 123.

Scolytus (s. str.) *frontalis* : Schedl, 1932, Catalogus Coleopterorum regionis palaearcticae, F. 1633.

Scolytus formosanus Eggers, 1932, Arb. morph. taxon. Ent., 2 : 115; Schedl, 1962, Beit. Ent., 12 : 486.

This species is distinguished from other members of this genus by the following characters : the frons has many long aciculate scratches which extend from mouth to vertex in the male

and margined with long curled yellow hairs, the interstrial punctures are not readily distinguishable from those of the striae, and the abdomen has not any tubercles. In Japan, this species is commonly found under bark of *Zelkova serrata*. There is a specimen in the NIIJIMA collection labeled "Sapporo, NIISIMA, 7, VIII, '02, Nire" and "*Scolytus frontalis* BLANDFORD ♀ (Allotype)", which was described in 1909 by NIIJIMA, but it was identified as *Scolytus trispinosus* STROHMEYER by SAWAMOTO. A record of *S. frontalis* BLANDFORD from Hokkaido seems to be erroneous. I could not find any other specimen collected from Hokkaido in the NIIJIMA collection.

Type locality : —Fukushima.

Hosts : —*Quercus aliena* BLUME, *Zelkova serrata* (THUNB.) MAKINO, and *Prunus sargentii* REHD.

Gallery : —Simple longitudinal tunnel.

Distribution : —Japan (Honshu, Shikoku, and Kyushu) and China (Taiwan).

Specimens from the following localities were examined. Aomori : Kominato. Iwate : Hayachine. Yamagata : Atsumi. Gunma : Oneyama, Kirizumi and Myôgi. Saitama : Tochimoto. Tokyo : Takao and Nakano. Kanagawa : Hanbara and Oyama. Yamanashi : Sasagotoge. Shizuoka : Yokokawa and Ohodaruonsen. Kyoto : Kibune. Kôchi : Makiyama and Monobemura. Ehime : Omogo. Formosa : Kuan tou chi and Forisha.

Japanese name : —Nirekawano-kikuimushi.

Scolytus jacobsoni SPESSIVTZEV

Scolytus jacobsoni SPESSIVTZEV, 1919, Ent. Month. Mag., 55 : 246; KURENZOV, 1935, Короеды Южного Сихотэ-Алиня, p. 22; KURENZOV, 1941, Короеды Дальнего Востока СССР, p. 91; SCHEDL, 1948, Zbl. Gesamtgeb. Ent., 1 : 39; KRIVOLUTZKAJA, 1958, Короеды Острова Сахалина, p. 112.

Scolytus (s. str.) *jacobsoni* : STARK, 1952, Фауна СССР, 31 : 115.

This species is readily distinguished from other species of this genus by having the close setae on the frons and a distinct process on the third abdominal segment in the male, by the short elytra, and by the wider interstriae and narrower striae. This species was recorded from Japan by KRIVOLUTZKAJA (1958), but I do not know of any specimen collected in Japan.

Type locality : —Vladivostok.

Host : —Unknown in Japan.

Distribution : —Japan, Saghalien, and Siberia.

Japanese name : —Jacobson-kikuimushi.

Scolytus japonicus CHAPUIS

Scolytus japonicus CHAPUIS, 1875, Ann. Soc. Ent. Belg., 18 : 199; BLANDFORD, 1894, Trans. Ent. Soc. London, 1894 : 80; NIIJIMA, 1905, Jour. Sapporo Agr. Coll., 2 : 72; NIIJIMA, 1909, Jour. Coll. Agr., Tohoku Imp. Univ., 3 : 121; NIIJIMA, 1913, Trans. Sapporo Nat. Hist. Soc., 5 : 1; NIIJIMA, 1913, Forest entomology, p. 124; MURAYAMA, 1930, Jour. Chôsen Nat. Hist. Soc., 11 : 10; MURAYAMA, 1940, Ann. Zool. Japon., 19:230; SCHEDL, 1948, Zbl. Gesamtgeb. Ent., 1:19; NIIJIMA et MURAYAMA, 1950, Iconographia Insectorum Japonicorum, p. 1290; INOUYE, 1953, A detailed book of the forest insect control, 2 : 159; MURAYAMA, 1954, Bull. Fac. Agr. Yamaguti Univ., 5 : 155; KABE, 1955, Studies on the galleries of bark-beetles and ambrosia-beetles in Japan, p. 65; KABE, 1959, Nipponsan Kikuimushirui Shokkon Zusetsu, p. 70; KABE, 1960, On the hosts and habits

of the Scolytid and Platypodid beetles in Japan, p. 5; SOKANOVSKY, 1960, Rev. d'Ent. l'URSS, 39 : 676; MURAYAMA, 1961, Publ. Ent. Labr., Univ. Osaka Pref., 6 : 93; NAKANE, OHBAYASHI, NOMURA, et KUROSAWA, 1963, Iconographia Insectorum Japonicorum, 2 : 381; MURAYAMA, 1965, Scolytid beetles from Niigata Prefecture, Japan II, p. 4.

Eccoptogaster japonicus HAGEDORN, 1910, Coleopterorum Catalogus, 4 : 84; HAGEDORN, 1910, Genera Insectorum, 111 : 123.

Scolytus (*Ruguloscolytus*) *japonicus* : SCHEDL, 1932, Catalogus Coleopterorum regionis palaearcticae, F. 1632; STARK, 1952, Фауна СССР, 31 : 143.

This species appears to be the most widely distributed and abundant representative of the genus in Japan. It is closely related to *S. ussuriensis* KURENZOV, but may be distinguished from the latter by the sparser setae on the frons, by the absence of interstrial punctures, and by the sparser hairs on the porterior margin of the fifth abdominal segment.

Type locality : —Kyushu.

Hosts : —*Ulmus davidiana* PLANCHON var. *japonica* (REHD.) NAKAI, *Zelkova serrata* (THUNB.) MAKINO, *Prunus salicina* LINDLEY, *P. mume* SIEB. et ZUCC., *P. persica* BÊTSCH, *P. sargenti* REHD. subsp. *jamasakura* (SIEB.) OHWI, *P.* sp., *Malus pumila* MILLER var. *domestica* SCHNEIDER, and *Pyrus serotina* REHDER.

Gallery : —Simple longitudinal tunnel.

Distribution:—Japan (Hokkaido, Honshu, Shikoku, and Kyushu), Korea, Siberia, Mongolia, and China (Taiwan).

Specimens from the following localities were examined. Hokkaido : Zyozankei. Tokyo : Setagaya, Meguro, Kokubunji and Takao. Kyoto : Kibune and Arashiyama. Wakayama : Tanabe. Kagawa : Ritsurinkôen. Kôchi. Fukuoka : Dazaifu. Korea : Seiryori.

Japanese name : —Nihon-kikuimushi.

Scolytus ratzeburgi JANSON

Scolytus ratzeburgi JANSON, 1856, Ent. Ann., 1856 : 87; DOEBNER, 1862, Zool., 2 : 162; THOMSON, 1865, Skandinaviens Coleoptera, 7 : 374; CHAPUIS, 1873, Mém. Soc. R. Sci. Liège, 2 : 261; EICHHOFF, 1881, Die europäischen Borkenkäfer, p. 150; BEDEL, 1888, Coléoptères du bassin de la Seine, 6 : 387, 405; REITTER, 1894, Bestimmungstabelle der Borkenkäfer, p. 40; BARBEY, 1901, Les Scolytides de l'Europe centrale, p. 35; SPESSIVTSEFF, 1922, Medd. från statens Skogsförsöksanstalt, 19 : 457; ESCHERICH, 1923, Die Forstinsekten Mitteleuropas, 2 : 489; MUNRO, 1926, For. Comm. Bull., 8 : 44; MURAYAMA, 1939, Ann. Zool. Japon., 18 : 137; MURAYAMA, 1940, Ibid., 19 : 229; MURAYAMA, 1941, Chohakusan Sôgochosa Hokoku, p. 159; NIIJIMA, 1943, Trans. Sapporo Nat. Hist. Soc., 17 : 142; SCHEDL, 1948, Zbl. Gesamtgeb. Ent., 1 : 49, PFEFFER, 1955, Fauna ČSR, 6 : 82; SOKANOVSKY, 1960, Rev. d'Ent. l'USSR, 39 : 676.

Eccoptogaster ratzeburgi : RATZEBURG, 1837, Die Forstinsekten, 1 : 187; HAGEDORN, 1910, Coleopterorum Catalogus, 4 : 87; HAGEDORN, 1910, Genera Insectorum, 111 : 124.

Eccoptogaster destructor RATZEBURG, 1837, Die Forstinsekten, 1 : 187 (nec. OLIVIER); BACH, 1854, Käferfauna, für Nord- und Mitteldeuschland, 5 : 140.

Scolytus destructor : THOMSON, 1865, Skandinaviens Coleoptera, 7 : 373.

Eccoptogaster (*Scolytus*) *amurensis* EGGERS, 1908, Wien. ent. Ztg., 27 : 144.

Eccoptogaster sahlbergi EGGERS, 1912, Ent. Blätt., 8 : 204.

Eccoptogaster sibiricus Eggers, 1922, Ent. Blätt., 18 : 14.

Scolytus (s. str.) *sibiricus* Butovitsch, 1929, Stettin. ent. Ztg., 90 : 47; Schedl, 1932, Catalogus Coleopterorum regionis palaearcticae, F. 1633; Stark, 1952, Фауна СССР, 31 : 119.

Scolytus sibiricus : Niijima, 1943, Trans, Sapporo Nat. Hist. Soc., 17 : 142.

This species is easily recognized by its large body, by the carinate median line on the frons, and by the northern distribution.

Type locality : —Europe.

Gallery : —Simple longitudinal tunnel.

Distribution : —Japan (Hokkaido), Korea, Siberia and Europe.

Specimens from the following localities were examined. Hokkaido : Kushiro. Siberia : Vanins.

Japanese name : —Ratzeburg-kikuimushi.

Scolytus ussuriensis Kurenzov

Scolytus ussuriensis Kurenzov, 1941, Короеды Дальнего Востока СССР, pp. 102, 226; Schedl, 1948, Zbl. Gesamtgeb. Ent., 1 : 23; Stark, 1952, Фауна СССР, 31 : 144; Murayama, 1965, Scolytid-beetles from Niigata Prefecture, Japan II, p. 4.

This species is closely related to *S. japonicus* Chapuis, but is readily distinguished by the more distinct interstrial punctures and by very dense hairs at apex of the fifth abdominal segment.

Type locality : —River Suputinka.

Hosts : —*Prunus mume* Sieb. et Zucc. and *P. persica* Bêtsch.

Distribution : —Japan (Honshu) and Siberia.

Specimens from the following localities were examined. Yamanashi : Kôfu. Kyoto : Arashiyama.

Japanese name : —Ussuri-kikuimushi.

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Explanation of Plates

Plate 1

Fig. 1 *Scolytus aomoriensis* Nobuchi sp. nov. (Holotype)
Fig. 2 *Scolytus aratus* Blandford (Type of *Scolytus aequipunctatus* Niijima)
Fig. 3 *Scolytus chikisanii* Niijima (Lecotype)
Fig. 4 *Scolytus betulae* Niijima (Type)
Fig. 5 *Scolytus curviventralis* Niijima (Type), lateral aspect
Fig. 6 *Scolytus claviger* Blandford
Fig. 7 Ditto ♂, lateral aspect, p : process
Fig. 8 *Scolytus dahuricus* Chapuis
Fig. 9 *Scolytus ellipticus* Murayama

Plate 2

Fig. 10 *Scolytus esuriens* Blandford
Fig. 11 *Scolytus frontalis* Blandford ♀
Fig. 12 Ditto ♂
Fig. 13 *Scolytus japonicus* Chapuis
Fig. 14 *Scolytus jacobsoni* Spessivtzev
Fig. 15 Ditto ♂, lateral aspect
Fig. 16 *Scolytus ratzeburgi* Janson
Fig. 17 *Scolytus ussuriensis* Kurenzov
Fig. 18 Fore leg of *Scolytus frontalis* Blandford

キクイムシ科の研究　第11報

日本産ゾウキカワノキクイムシ属（鞘翅目）

野　淵　　輝[1]

摘　　要

ゾウキカワノキクイムシ属は全世界に広く分布しているが，ほとんどの種類は北半球北部に分布する。日本の種類は12種類で，シデ類，シラカバ類，ニレ類，ケヤキ，サクラ類，ウメなどの内樹皮に穿入加害し，一夫一妻性の bark beetle である。普通は伐採木，枯死木，衰弱木を攻撃するようであるが，病原菌を媒介する種類もいる。

この属のキクイムシは，キクイムシ科の中でも原始的でゾウムシ科に近い形態をそなえ，孤立した群である。すなわち，外部形態からは中間節が7節からなり，脛節外方先端部には尖った1突起をそなえ，翅鞘には斜面部がなく，腹部腹面が上方に傾斜している。また，内部形態，特に前胃，交尾器は非常に異質な形態をしている。

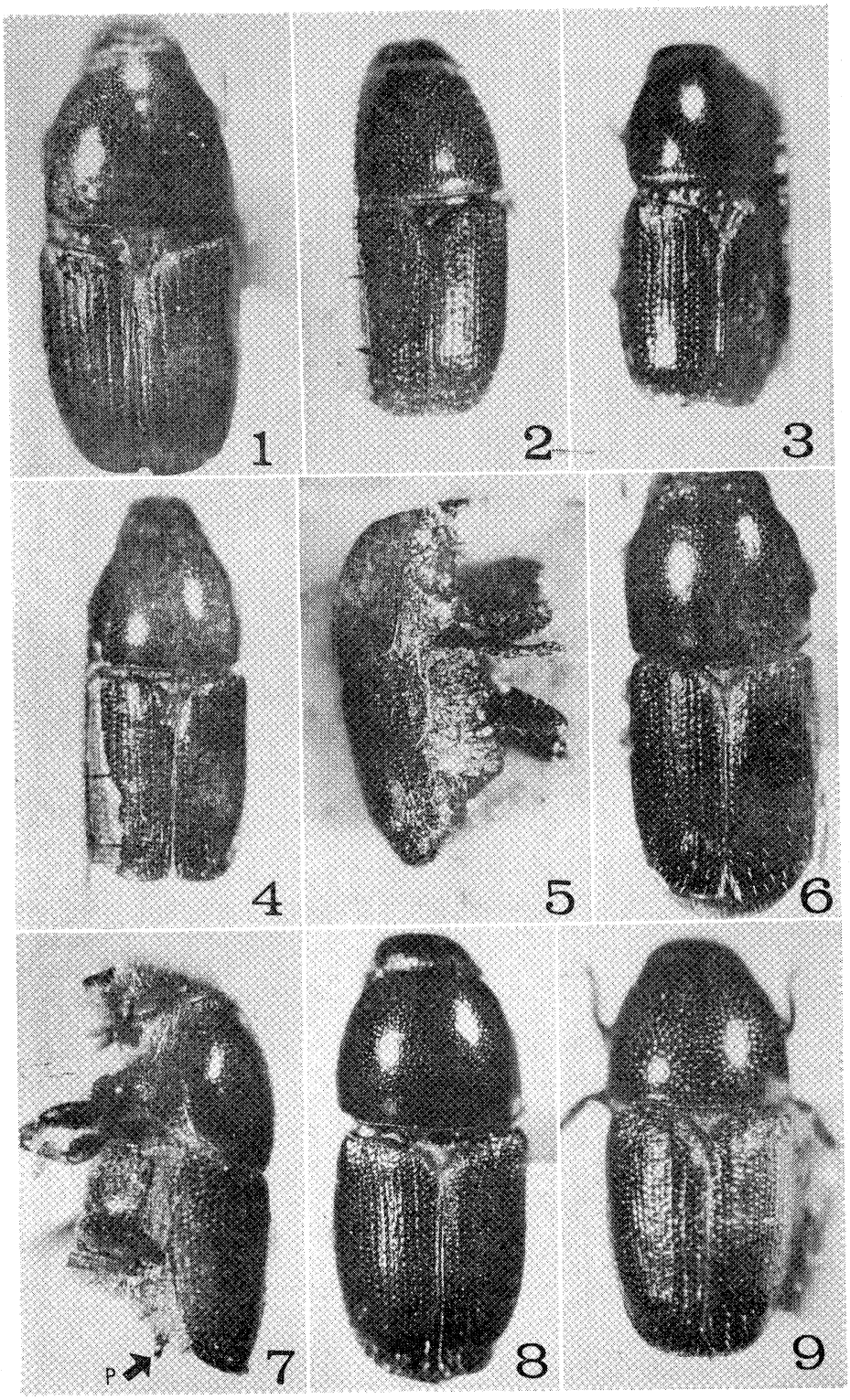
筆者は新島コレクション，故高橋慶二郎氏収集の標本，ならびに筆者自身収集した標本1,033点について分類学的な研究を実施した。その結果1新種を発見し，アオモリキクイムシ（*Scolytus aomoriensis* Nobuchi）と名づけた。*Scolytus betulae* Niijima とニレノキクイムシ（*Scolytus chikisanii* Niijima）の模式標本を比較したところ，個体変異の範囲内にあることが判明したのでシノニムとした。同定を容易ならしめるため全種の検索表を作成し，各種ごとの加害樹種，分布を列記した。この研究の結果，日本の種類は12種で，加害樹種，分布は次のとおりである。

1. アオモリキクイムシ（*Scolytus aomoriensis* Nobuchi）
   加害樹種：不明
   分　　布：日本（本州）
2. ウメノキクイムシ（*Scolytus aratus* Blandford）
   加害樹種：タブノキ，ウメ，シナミザクラ，リンゴ，ナナカマド
   分　　布：日本（北海道，本州），サハリン，クリル列島，シベリア
3. ニレノキクイムシ（異名：ニレノクロキクイムシ）（*Scolytus chikisanii* Niijima）
   加害樹種：シラカバ，ハルニレ
   分　　布：日本（北海道，本州），サハリン，クリル列島，シベリア，中国（東北地方）
4. サワシバノキクイムシ（*Scolytus claviger* Blandford）
   加害樹種：アカシデ，クマシデ，サワシバ
   分　　布：日本（北海道，本州，九州），朝鮮，シベリア，中国（東北地方）

1973年7月13日受理

(1) 保護部

5. シラカバノキクイムシ（異名：ダフリアキクイムシ）（*Scolytus dahuricus* Chapuis）
   加害樹種：シラカバ，ダケカバ，タブノキ
   分　　布：日本（北海道，本州），サハリン
6. アサマヤマキクイムシ（*Scolytus ellipticus* Murayama）
   加害樹種：クマシデ，ウメ，ナナカマド
   分　　布：日本（北海道，本州）
7. ニレノオオキクイムシ（異名：ミツハリキクイムシ）（*Scolytus esuriens* Blandford）
   加害樹種：サワグルミ，シラカバ，ハルニレ，オオバボダイジュ
   分　　布：日本（北海道，本州），クリル列島，シベリア
8. ニレカワノキクイムシ（異名：ニレノヒメキクイ）（*Scolytus frontalis* Blandford）
   加害樹種：ナラガシワ，ケヤキ，オオヤマザクラ
   分　　布：日本（本州，四国，九州），中国（台湾）
9. ジャコブソンキクイムシ（*Scolytus jacobsoni* Spessivtzev）
   加害樹種：不明
   分　　布：日本，サハリン，シベリア
10. ニホンキクイムシ（*Scolytus japonicus* Chapuis）
   加害樹種：ハルニレ，ケヤキ，スモモ，ウメ，モモ，ヤマザクラ，サクラの1種，リンゴ，ナシ
   分　　布：日本（北海道，本州，四国，九州），朝鮮，シベリア，モンゴリア，中国（東北地方）
11. ラッツェブルグキクイムシ（*Scolytus ratzeburgi* Janson）
   加害樹種：シラカバ
   分　　布：日本（北海道），朝鮮，シベリア，ヨーロッパ
12. ウスリーキクイムシ（*Scolytus ussuriensis* Kurenzov）
   加害樹種：ウメ
   分　　布：日本（本州），シベリア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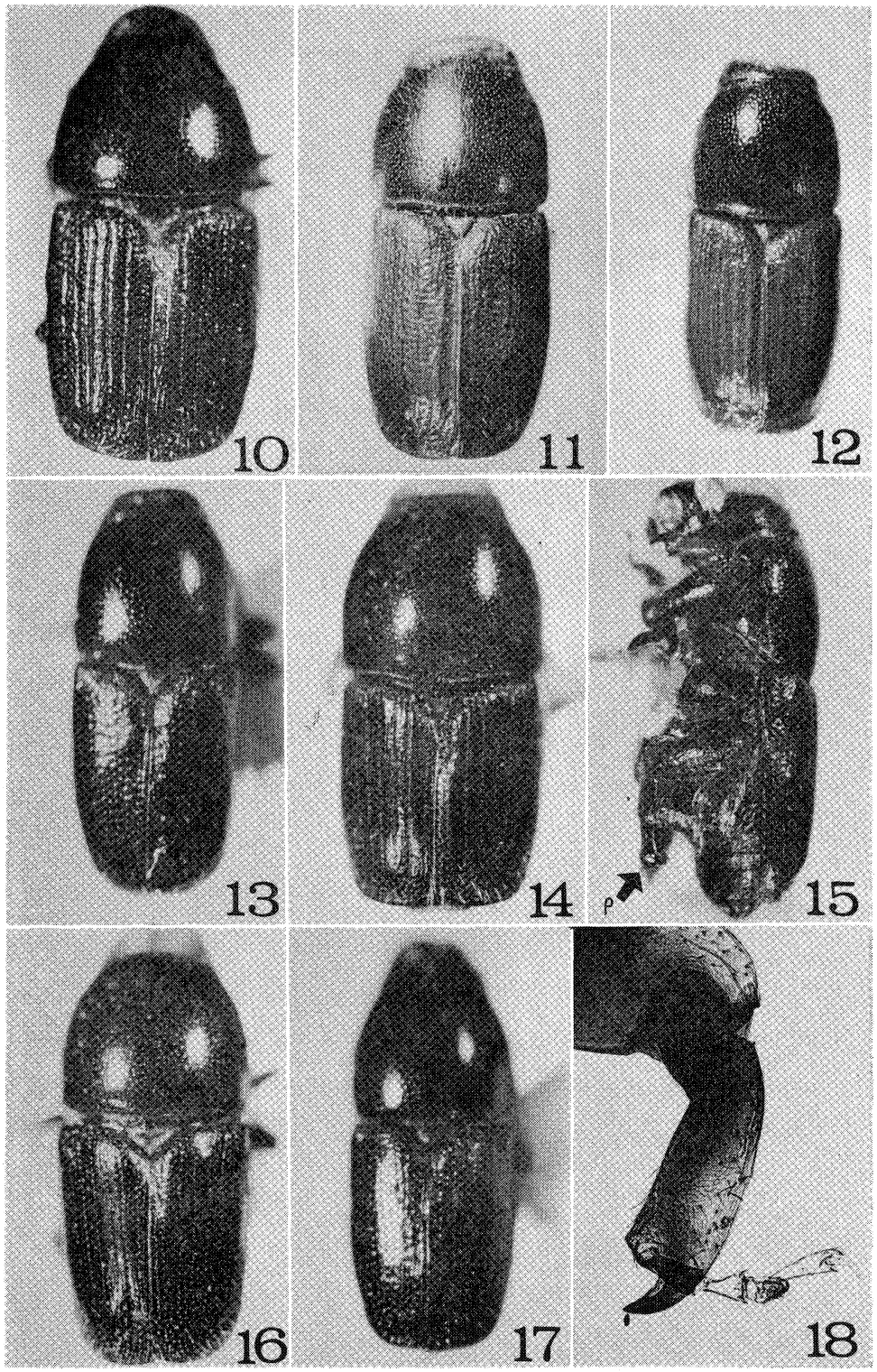
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