

針葉樹寄生北海道産コキクイ類 *Cryphalus* の再検討

井 上 元 則⁽¹⁾
野 淵 輝⁽²⁾

1. ま え が き

北海道においては 1954 年の 15 号台風で、針葉樹の風倒木がおよそ 6,000 万石も生じた結果、キクイムシの被害が目だつてきている。本稿において論ずる *Cryphalus* 属のものはキクイムシ科のうちでも微小な一群であつて、その同定がきわめて困難である。

最近では風倒木の枝条、末木で増殖したカラマツコキクイが羽幌、古丹別地方の林間苗畑や新植地のトドマツ稚樹を枯死せしめたなどの事実もあつて、本属の再検討が強く要望されるにいたつた。

いままでシベリヤにおけるキクイムシの文献が入手できず、それらの分布が不明のままになつていたところ、幸いソビエツトの A. I. KURENZOV 及び B. H. STARK 等のキクイムシ論文を入手することができたので故新島善直博士の標本を参照しながら、当昆虫研究室員の多年にわたる採集標本を検討することができた。まだ完成とはいいいがたいが一応今まで採集したものを整理し取りまとめたので、ここに発表する。

なおこの研究を遂行するにあたつて種々援助を寄せられた小杉孝蔵技官、山口博昭技官、西島浩氏に深謝の意を表する。

2. 従 来 の 知 見

針葉樹寄生北海道産コキクイ類についての最初の記録を年代順に記すと次のとおりである。

種 名	記録年代	記録者
1. トウヒノコキクイ <i>Cryphalus piceae</i> RATZ.	1907	新 島 善 直
2. カラマツコキクイ <i>Cryphalus laricis</i> NIISIMA	1909	〃
3. ジョウザンコキクイ <i>Cryphalus piceus</i> EGGERS	1926	EGGERS
4. モミノコキクイ <i>Cryphalus abietis</i> RATZ.	1928	原 田 真 幸
5. ハツトリコキクイ <i>Cryphalus hattorii</i> KÔNO	1938	河 野 広 道
トウヒノコキクイ <i>Cryphalus piceae</i> RATZ.	〃	〃
6. ネットカコキクイ <i>Cryphalus joholensis</i> MURAYAMA	1940	沢 本 孝 久

ここで問題になるのは *Cryphalus abietis* RATZ. が 1928 年北海道のエゾマツから記録（原田真幸：エゾマツ寄生小蠹虫類の生態的研究）されているが、その後多くの昆虫学者が、北海道で採集した標本のなかにこの種をどうしても発見できなかった。もともとこの種は西ヨーロッパから中央ヨーロッパにかけて産する種であつて、A. I. KURENZOV の著書（1941）「極東ソビエツトのキクイムシ」中に本種が入

(1) 北海道支場保護部長・農学博士 (2) 保護部昆虫研究室員

つていない。また、B. H. STARK の著書 (1952)「ソビエツトのキクイムシの分類学的研究」によると、やはり極東ソビエツトに産しないとしているから、今のところ日本には産しないとみる方が正しいと思う。

次は、*Cryphalus hattorii* KONO は野淵が北大のご好意で Type を検鏡させていただいた結果 *Cryphalus piceae* RATZ. と同じものであることがわかった。

また B. H. STARK によると、*Cryphalus piceae* RATZ. は極東ソビエツトに産しないから日本に産すると思われないと記しているが、1955年井上がドイツのゲツチンゲン大学昆虫学教室から分譲してもらった *Cryphalus piceae* RATZ. を北海道のものと比較すると全く同一であるから *Cryphalus piceae* RATZ. は北海道に産するものと思う。

3. 研究結果

今回の研究結果、北海道の針葉樹には前記4種のほか新たに *Cryphalus jezoensis* INOUE et NOBUCHI (エゾマツコキクイ) と *C. niponensis* INOUE et NOBUCHI (ニホンコキクイ)、*C. yamaguchii* INOUE et NOBUCHI (ヤマグチコキクイ) の3種を追加することができた。

次に今回の研究結果を一覧表をもつて示せば次のとおりである。

針葉樹寄生北海道コキクイ一覧表

番号	種 名	寄 生	分 布
1	<i>Cryphalus piceae</i> RATZ. トウヒノコキクイ	トドマツ、モミ、ア オモリトドマツ、エ ゾマツ、アカエゾマ ツ	北海道、本州、四国、 千島、樺太、朝鮮、 満州、ヨーロッパ
2	<i>Cryphalus laricis</i> NIISIMA カラマツコキクイ	信州カラマツ、エゾ マツ、トドマツ、チ ヨウセンマツ、欧州 アカマツ、アカマツ、 クロマツ、米松	北海道、本州
3	<i>Cryphalus piceus</i> EGGERS ジョウザンコキクイ	エゾマツ、アカエゾ マツ、欧州トウヒ、 モンタナマツ	北海道、シベリヤ
4	<i>Cryphalus joholensis</i> MURAYAMA ネツカコキクイ	アカマツ、クロマツ、 欧州クロマツ、満州 マツ	北海道、本州、四国、 満州
5	<i>Cryphalus jezoensis</i> INOUE et NOBUCHI エゾマツコキクイ	エゾマツ	北海道 (大雪山系)
6	<i>Cryphalus niponensis</i> INOUE et NOBUCHI ニホンコキクイ	エゾマツ	北海道 (大雪山系)
7	<i>Cryphalus yamaguchii</i> INOUE et NOBUCHI ヤマグチコキクイ	トドマツ	北海道 (大雪山系)

なお、これらの形態の検索表を掲げると次の通りであるが、詳細は欧文記載を参照されたい。

北海道の針葉樹に加害するコキクイ類 (*Cryphalus*) の検索表

1. 触角の中間部は3節より成る.....*C. yamaguchii* n. sp.
——触角の中間部は4節より成る..... 2
2. 翅鞘には列間部に小瘤列がある..... *C. laricis* NIISIMA
——翅鞘には列間部に小瘤列がない..... 3
3. 翅鞘の点列部の点刻は明瞭で、浅くて大きい、あるいは深くて小さい..... 4

- 翅鞘の点列部の点刻は不明瞭で、列間部にあるものとはほとんど同様…………… 6
4. 翅鞘は非常に短く直立した剛毛を有する。翅鞘中間部の鱗状形剛毛は非常に密に生ずる。翅鞘点列部には深くて小さい点刻があり、刻明でない。体は大形 (2.1 mm) ……*C. jezoensis* n. sp.
- 翅鞘は長く直立した剛毛を有する。翅鞘中間部の鱗状形剛毛は密である。翅鞘点列部は浅くて大きい点刻を有する。体は中形 (1.8 mm より小さい) …………… 5
5. 体は長く楕円形、翅鞘は先端に向つてしだいに円味をおびる。雄では額に縦隆起がある
…………… *C. piceae* RATZ.
- 体は比較的短くて頭丈、翅鞘は先端の近くで急に円味をおびる。雄では額に横隆起線がある
……………*C. joholensis* MURAYAMA
6. 体は小さく (1.5 mm)、前胸は翅鞘に比較して大きい。翅鞘には長い剛毛連生し、列間部上には鱗状形剛毛が粗生する。雄では額に横隆起線がある。…………… *C. piceus* EGGERS
- 体は大きく (1.8 mm)、前胸は翅鞘に比較して短い。翅鞘はやや短い剛毛を有し、列間部上には鱗状形剛毛密生する。雄では額に幅の狭い縦隆起がある。……………*C. niponensis* n. sp.

4. 結 び

今回の研究結果、北海道の主要針葉樹に寄生し、分布が広く密度の高い種類は1) トウヒノコキクイ、2) カラマツコキクイ、3) ジョウザンコキクイの3種であることが判明した。4) ネットコキクイは今のところ *Pinus* 属だけに寄生している。5) エゾマツコキクイ、6) ニホンコキクイ、7) ヤマゲコキクイは種としては新しく追加され珍しいものであるが、その採集は今のところ層雲峡奥地のトドマツ、エゾマツに限られているので、その分布と実害については、今後さらに道内各地の標本を多数採集してみないと判然しない。

また、No. 1~3 の3種はいずれも *Picea* 属に寄生するので種名が混同されやすい。これらの害虫は単に枝条に加害するだけでなく、青変菌を媒介するので、*Picea*, *Abies*, *Pinus* 属の枯死をあるいは助長する傾向をもっていることも考えられるので密度の増大に対して常に注意を要する。

今後育種事業の発展に伴い、外国産針葉樹が輸入される場合、カラマツコキクイ、ジョウザンコキクイの加害は特に、警戒を要するものと思われる。

**A Revision of *Cryphalus* Species Injurious to Coniferous Trees from Hokkaido,
Japan (Coleopt., Scolytidae)**

Motonori INOUE and Akira NOBUCHI

Certain species of the genus *Cryphalus*, belonging to the family Scolytidae, usually are secondary enemies, attacking branches of felled or dying trees in coniferous forests, but they are occasionally capable of attacking the terminal shoots of living trees or the trunk of healthy young trees in Hokkaido.

In this paper the writers deal with the *Cryphalus* species that attack coniferous trees in Hokkaido, particularly with respect to their specific names, together with a certain revision based on their recent investigations.

In 1907 and 1909, Dr. Y. NIISIMA described a new bark beetle, *Cryphalus laricis* NIISIMA and an unrecorded species, *Cryphalus piceae* RATZ. from Hokkaido.

In 1926, Dr. F. H. EGGERS described a new species, *Cryphalus peceus* EGGERS from Hokkaido.

In 1938, Dr. H. KÔNO wrote on a new species, *Cryphalus hattorii* KÔNO = *Cryphalus piceae* RATZ. from Hokkaido.

In 1940, Dr. T. SAWAMOTO reported a previously unrecorded species, *Cryphalus joholensis* MURAYAMA from Hokkaido.

It will be seen from these previous papers that five species of *Cryphalus* have been recorded on coniferous trees from Hokkaido. From investigations made by the present writers, however, three new species will have to be added, while the synonym has to be struck out of the list.

Before going further, we wish to express here our sincere thanks to Mr. Hiroaki YAMAGUCHI for his kindness in supplying the materials, to Mr. Kozo KOSUGI for the loan of the literature, and to Mr. Hiroshi NISHIJIMA (The Entomological Laboratory of Hokkaido University), for his kindness in examining the type specimens of *Cryphalus hattori* Kôno.

The types and representatives of all the species are preserved in the collection of the Entomological Research Laboratory, the Hokkaido Branch of the Government Forest Experiment Station, Sapporo, Japan.

Genus *Cryphalus* ERICHSON

Archiv f. Naturg., 1, p. 61 (1831)

Key to *Cryphalus*-species injurious to the coniferous trees in Hokkaido.

1. Antennal funicles composed of three segments *C. yamaguchii* n. sp.
—Antennal funicles composed of four segments. 2
2. Elytra with a row of fine granules on elytral interstices. *C. laricis* NIISIMA
—Elytra without a row of granules on elytral interstices 3
3. Punctures on elytral striae distinct, shallow and large, or deep and small 4
—Punctures on elytral striae not distinct, nearly equal to those on interstices .. 6
4. Elytra with very short, erect setae, squamiform setae on elytral interstices

- very dense. Elytral striae with deep and small punctures, not impressed.
 Body large type (2.1 mm) *C. jezoensis* n. sp.
- Elytra with long erect setae. Squamiform setae on elytral interstices dense.
 Elytral striae with shallow and large punctures. Body middle type (less than 1.8 mm) 5
5. Body long and elliptical. Elytra gradually rounded to apex. In male with a longitudinal elevation at frons *C. piceae* RATZ.
 —Body comparatively short and stout. Elytra acutely rounded to near apex.
 In male with a transverse carina at frons *C. joholensis* MURAYAMA
6. Body small (1.5 mm). Prothorax larger compared with elytra. Elytra with long seriate setae and less dense squamiform setae on elytral interstices. In male, frons with a transverse laminato-carina *C. piceus* EGGERS
 ---Body large (1.8 mm). Prothorax shorter compared with elytra. Elytra with rather short setae and dense squamiform setae on elytral interstices. In male, frons with a narrow longitudinal elevation *C. niponensis* n. sp.

***Cryphalus jezoensis* n. sp. (Figs. 1 & 11)**

Body large, elongate, cylindrical, nearly parallel-sided; black to blackish-brown, mouth-parts (except mandibles), antennae and legs paler, dully shining, setiferous.

Head finely punctate, reticulate on lateral sides and vertex, frons weakly convex, strongly shining and smooth in middle and rugose in posterior part, closely setiferous, in male with a longitudinal elevated line at middle. Eyes oval, emarginate at anterior margin. Antennal funicles composed of four joints; clubs oval. Prothorax wider than it is long, widest on just anterior part of base, basal corners obtusely angulate, lateral sides narrowing anteriorly, anterior margin strongly rounded and with some thin marginal tubercles, basal margin bisinuate and very narrowly marginate; dorsum strongly convex, also strongly upheaved behind center, many thin tubercles sparsely scattered, closely granulate (more closely at base) and rugose on interspaces. Scutellum small, nearly triangular and shining. Elytra slightly wider than prothorax, nearly two-thirds as wide as long, lateral sides not or slightly narrowing anteriorly and posteriorly, strongly rounded at apex, humeral angles rounded; dorsal surface strongly convex and humeral callosities small, not striate but distinctly finely lineato-punctate and minute setae, interspaces flattened and finely but densely punctured, very closely covered with short scales and short seriate setae.

Body length: ca. 2.1 mm.

Cotypes: 13 Exs., Sounkyo, Daisetsu-zan National Park, Hokkaido, Japan, Aug. 22, 1952, Coll. by M. INOUE.

Host: *Picea jezoensis*.

Habitat: Hokkaido (Sounkyo).

This new species is somewhat allied to *C. saltuarius* WSE., but may be distinguished from the latter by its deep and very fine lineato-puncture on elytra. It is also allied to *C. abietis* RATZ., but may be easily distinguished by deep and small punctures and not impressed on elytral striae.

***Cryphalus joholensis* MURAYAMA (Fig. 2)**

Cryphalus joholensis MURAYAMA, Ann. Zool. Jap., Vol. 18, No. 2, p. 143 (1939); *ibid.*, Trans. Biol. Soc. Manch., Vol. 3, No. 2, p. 34, (1940); SAWAMOTO, Ins. Mats., Vol. 14, No. 4, p. 145 (1940); MURAYAMA, Bull. Fac. Agr. Yamaguchi Univ., No. 3, p. 20 (1952); *ibid.*, Trans. Shikoku Ent. Soc., Vol. 3, pts. 5 & 6, p. 151 (1953); *ibid.*, Bull. Fac. Agr. Yamaguchi Univ., No. 5, p. 163 (1954).

This species was first recorded from Hokkaido by SAWAMOTO (1940), but unfortunately we cannot find specimens in our collections. Therefore, this is a translation from MURAYAMA's French original.

Body oblong, reddish-brown, opaque, elytra blackish-brown, antennae and legs yellowish-brown.

Head globose, obscure, granulate; frons granulate, having an excavation behind labrum, with uncertain elevation transverse, with erect, long and yellow setae; vertex convex, in male with a transverse carina, having minute obscure granulation behind the groove, in female vertex without a carina, convex, obscure. Eyes black, lenticular, anterior margin emarginate by antennae. Antennae inserted near anterior margin of eyes; funicles four-segmented; club oval, black, shining, with nearly straight transverse sutures. Prothorax semioval, narrowing anteriorly, wider than its length, basal margin slightly sinuate, basal angle almost rectangular; disc strongly convex, tubercles extending triangularly beyond anterior half, closely granulate and covered with short setae, having four to six minute denticulations on anterior border. Scutellum small, semicircular. Elytra convex, nearly as wide as prothorax, and about two-thirds as wide as long; humeral angles almost rectangular, lateral sides parallel as far as anterior three-fourths, rounded and declivous to tip; surface, humeral callosities small, convered with seriate and rounded punctures, interstices large, densely set yellow scales, erect and long setae.

Body length: 1.62 mm in male, 1.66 mm in female.

Hosts: *Pinus densiflora* (Shikoku), *Pinus tabulaeformis* (Manchuria), *Pinus thumbergii* (Honshu) and *Pinus nigra* (Hokkaido).

Habitat: Hokkaido, Honshu, Shikoku, Manchuria.

***Cryphalus laricis* NIISIMA (Figs. 3 & 10)**

Cryphalus laricis NIISIMA, Journ. Coll. Agr., Tohoku Imp. Univ., Sapporo, Vol. 3, pt. 2, p. 142 (1909); KONO, Ins. Mats., Vol. 12, No. 2 & 3, p. 67 (1938); SAWAMOTO, Ins. Mats., Vol. 14, No. 2 & 3, p. 100 (1940).

Belongs to short elliptical type together with *C. piceus*. Body cylindrical, sides not quite parallel; yellowish-brown to blackish-brown, prothorax usually darker than elytra in many specimens, opaque, elytra slightly shining, clothed with setae.

Head closely and distinctly rugoso-punctate, with rather sparse clothing of upright setae; frons subconvex, with triangularly impressed and weakly carinate longitudinally at middle, and feebly raised at each side of the carina, nearly shining. Eyes rather large, emarginate anteriorly. Antennal funicles composed of four segments, second segment stout, clubs oval. Prothorax wider than length at base, lateral sides roundly narrowed to apex, part just behind anterior margin decorated with a row of some fine tubercles, basal border bisinuate and very narrowly marginate, hind angles strongly

rounded; upper surface strongly convex and again upheaved behind center, closely covered with conspicuous and rounded granulations, which are stronger on base and lateral parts than those on frontal, and closely clothed with decumbent setae, and with strongly and rather closely scattered tubercles. Elytra at base a little wider than those of pronotum, about four-fifths as wide as long, parallel-sided and roundly convergent strongly to apex, humeral angles obtusely angulate; surface strongly convex, humeral callosities small and indistinct, striae distinctly impressed and with a row of large but shallow punctures, and very fine setae; interstices slightly convex and finely punctured, and with relatively sparse clothing of rather narrow but long squamiform setae in comparison with other species, and with a row of minute granules bearing long setae. Teeth of middle margin of masticatory plate of proventriculus (Zähne an medianen Kauplattenrand) not pointed.

Body length: ca. 1.8 mm.

Hosts: *Larix leptolepis*, *Picea jezoensis*, *Abies sachalinensis*, *Pseudotsuga taxifolia*, *Pinus koraiensis*, *Pinus silvestris*, *Pinus thunbergii*, *Pinus densiflora*.

Specim. ex.: Gamushi (5 Exs., May 10, 1956, A. NOBUCHI), Abuta (1 Ex., *Picea jezoensis*, June 5, 1951, M. INOUE; 6 Exs., Sept. 1, 1955, A. NOBUCHI), Tomakomai (3 Exs., *Picea jezoensis*, July 5, 1954, H. YAMAGUCHI); Nopporo (3 Exs., Aug. 17, 1932, M. INOUE; 6 Exs., *Abies sachalinensis*, July 18, 1941, M. INOUE; 45 Exs., *Abies sachalinensis*, Sept. 20, 1951, M. INOUE; 11 Exs. *Abies sachalinensis* April 8, 1953, M. INOUE), Jyozankei (8 Exs., *Abies sachalinensis*, May 30, 1949, M. INOUE; 6 Exs., *Abies sachalinensis*, Feb. 28, 1953, M. INOUE; 43 Exs., *Abies sachalinensis*, March 24 & 25, 1953 M. INOUE), Hiroshima (1 Ex., July 17, 1941, M. INOUE), Notoro (15 Exs., *Abies sachalinensis*, M. INOUE), Wakasaroma (9 Exs., *Larix leptolepis*, July 11, 1951, M. INOUE), Kagura (9 Exs., *Abies sachalinensis*, July 7, 1956, H. YAMAGUCHI; 2 Exs., July, 1956, A. NOBUCHI; 33 Exs., *Abies sachalinensis*, Aug. 10, 1956, H. YAMAGUCHI; 9 Exs., *Abies sachalinensis*, Sept. 25, 1956, H. YAMAGUCHI), Haboro (2 Exs., Aug. 31, 1952, M. INOUE), Wakasakanai (54 Exs., *Abies sachalinensis*, Oct. 26, 1952, M. INOUE), Nogami (3 Exs., *Abies sachalinensis*, Aug. 23, 1942, M. INOUE), Ikutora (4 Exs., *Abies sachalinensis*, July 21, 1950, M. INOUE), Lake Mashu (2 Exs., *Abies sachalinensis*, Aug. 7, 1949, M. INOUE), Shari (9 Exs., June 20, 1936, M. INOUE), Abashiri (10 Exs., *Abies sachalinensis*, June 24, 1952, M. INOUE), Ponkikin (47 Exs., *Larix leptolepis*, Sept. 19, 1951, M. INOUE), Teshio (1 Ex., *Abies sachalinensis*, Aug. 1952, M. INOUE), Shimokawa (43 Exs., *Abies sachalinensis*, April 20, 1952, M. INOUE), Nakanayoro (2 Exs., *Abies sachalinensis*, April 20, 1952, M. INOUE), Pifuke (8 Exs., *Abies sachalinensis*, Aug. 12, 1952, M. INOUE), Yamabe (1 Ex., *Pinus silvestris*, July 9, 1956, H. NISHIGUCHI; 4 Exs., *Pinus koraiensis*, Aug. 25 & 27, 1956, H. NISHIGUCHI; 2 Exs., *Abies sachalinensis*, March 2, 1957, H. NISHIGUCHI; 10 Exs., *Pseudotsuga taxifolia*, April 12, 1957, H. NISHIGUCHI).

Habitat; Hokkaido, Honshu.

This species is widely and very commonly distributed in Hokkaido, and we think the species has often been mis-identified for *C. piceae* by some foresters and entomologists, but it is very distinctly characterized by the presence of a row of granules on interstices of elytral striae, shallow and large punctures on elytral striae and short body.

Cryphalus niponensis n. sp. (Figs. 4 & 13)

Body oblong, cylindrical, slightly expanded posteriorly; piceous in mature specimens to testaceous, nearly opaque, closely covered with setae and scales on elytra.

Head with vertex convex, minutely reticulate and finely punctulate, frons a little convex, not or slightly excavate to transverse behind mouth-parts, shining, sparsely punctate not reticulate, sparsely setiferous. Eyes black, oval, with an emargination at anterior margin. Antennal funicles four-segmented, second segment stout, nearly as long as two succeeding segments together, clubs oval. Prothorax wider than its length at base, widest just before base, lateral sides narrowing anteriorly and rounded together with anterior margin, frontal margin with about six nearly triangular small denticulations, basal margin very narrowly marginate, and slightly bisinuate, basal corners rounded; disc strongly convex and again raised before base, tubercles rather sparsely situated, nearly invertedly triangular, closely granulate, closely covered with decumbent setae. Scutellum small, triangular, shining, slightly convex. Elytra nearly equal in width to base of pronotum, nearly one-second as wide as its length, ratio of elytra to prothorax in length large compared to other species, lateral sides slightly expanded posteriorly and convergent roundly at apex, humeral angles almost rectangular; upper surface strongly convex, humeral elevations weak and small, striae very indistinctly or nearly obsoletely impressed, minutely punctate such as in interstices, with seriate clothing of very short decumbent setae; interstices flattened and finely punctate, densely squamous, and with a row of short setae. Proventriculus with weakly expanded laterally and scanty teeth (Hakenzähne) as Fig. in 13.

Body length; ca. 1.8 mm.

Host: *Picea jezoensis*.

Cotypes: 4 Exs., Sounkyo, Daisetsu-zan National Park, Hokkaido, Japan, May 15, 1955, Coll. by A. NOBUCHI.

Habitat: Hokkaido.

The present new species is very closely allied to *C. saltuarius* WSE., but may be distinguished by small prothorax, very close scales of elytra, not rugose interstices and lacking punctations on striae of elytra. And also it is very unique in proventriculus as compared with other *Cryphalus* species.

Cryphalus piceae RATZ. (Figs. 5 & 9)

Bostrichus piceae RATZBURG, Forstins., I, p. 163 (1837); *Cryphalus piceae* BACH, Käfer, II, p. 136 (1854); EICHHOFF, Rat. Tomic., p. 122 (1879); *ibid.*, Europ. Borkenkäfer, p. 172 (1881); NIIHIMA, Verh. k. k. Zool.-Bot. gesel. Wien, p. 89 (190); *ibid.*, Journ. Coll. Agr. Tohoku Imp. Univ., Sapporo, Vol. 3, pt. 2, p. 141 (1909); *ibid.*, Trans. Sapporo Nat. Hist. Soc. Vol. 3, p. 89 (1910); REITTER, Best.-Tab. Borkenkäfer, XXXI, Heft, 31, p. 66 (1913); MURAYAMA, Journ. Chosen Forest. Soc., No. 47, p. 42 (1927); NIIHIMA, Karafuto ni okeru Kikuimushi, p. 8 (1930); SPESSIVTSEFF, Publ. Agr. du gt. Moscow, Leningrad, p. 49 (1931); TAMANUKI, Ser. Rep. 3, Saghalien Centr. Exp. Stat., p. 5 (1933); KÔNO, Ins. Mats., Vol. 13, No. 2 & 3, p. 92 (1938); BALACHOWSKY, Faune de France, 50, p. 206 (1949); MURAYAMA, Matsumushi, Vol. 3, No. 4, p. 101 (1949); STARK, Fauna SSSR, 31, p. 260 (1952); MURAYAMA, Trans. Shikoku Ent. Soc., Vol. 3, pts. 5 & 6, p. 151 (1953); *ibid.*, Bull. Fac. Agr. Yamaguti Univ., No. 5, p. 164 (1954).

Cryphalus hattorii KÔNO; Ins. Mats., Vol. 13, No. 2 & 3, p. 67 (1938) (syn. nov.).

Body oblong, cylindrical, sides nearly parallel, reddish-brown (in many specimens of our collection) to darkened, dully shining, covered with setae and scale-like setae

on elytra.

Head subconvex, indistinctly punctured, lateral sides and vertex finely reticulate, frons narrowly and weakly impressed transverse, in male narrow and feeble upheaved on middle line and remarkably rugose, with setae closer and longer than those of female. Eyes oblong, emarginate at anterior margin. Antennal funicles four-jointed, second joint large, clubs oval. Prothorax shorter than its basal width, lateral sides nearly parallel at basal half and strongly rounded anteriorly, basal border bisinuous and very narrowly marginate, anterior margin (just before true anterior margin) with a row of about ten minute tubercles, basal corners rounded; disc strongly convex, scattered thin tubercles in anterior two-thirds, closely setiferous, and closely granulate but not larger than those of *C. laricis*. Scutellum small, nearly triangular. Elytra nearly two-thirds longer than width, with base as wide as base of pronotum, lateral sides widened posteriorly, gently rounded to apex, humeral angles rounded; upper surface strongly convex, rugged on basal part of middle, humeral elevations rather large, elytral striae not distinct (except rather distinct basal part), shallowly and rather distinctly punctured, and very short setiferous; interstices flattened, very finely punctured, and with squamiform setae and a row of long setae.

Body length: 1.4~1.8 mm. (about 1.7 mm. in length of most specimens).

Hosts: *Abies sachalinensis*, *Abies firma*, *Abies mariesii*, *Picea jezoensis*, *Picea glehni*.

Specim. ex.: Oketo (16 Exs., June 19, 1936, M. INOUE), Sounkyo (2 Exs., *Picea jezoensis*, Sept. 14, 1950, M. INOUE; 7 Exs., *Picea jezoensis*, Aug. 27, 1952, M. INOUE; 12 Exs., *Picea jezoensis*, Aug. 19, 1953, H. YAMAGUCHI; 6 Exs., *Picea jezoensis*, Aug. 23, 1953, H. YAMAGUCHI; 13 Exs., *Abies sachalinensis*, June 15, 1954, H. YAMAGUCHI; 25 Exs., *Picea jezoensis*, June 16, 1954, H. YAMAGUCHI; 7 Exs., June 17, 1954, H. YAMAGUCHI; 4 Exs., *Picea jezoensis*, Sept. 17, 1954, H. YAMAGUCHI; 16 Exs., *Abies sachalinensis*, Sept. 18, 1954, H. YAMAGUCHI; 12 Exs., *Picea jezoensis*, Sept. 18, 1954, H. YAMAGUCHI; 17 Exs., *Abies sachalinensis*, Sept. 19, 1954, H. YAMAGUCHI), Rikubetsu (6 Exs., Aug. 20, 1936, M. INOUE).

Habitat: Hokkaido, Honshu, Shikoku, Kuriles, Saghalien, Korea, Manchuria, Europe.

This species extends, skipping Eurasia, into the Japanese Islands, and has been known for quite a long time as one of the important pests of Todo-fir and Ezo-spruce in Hokkaido. It is also known to be closely allied to *C. abietis* RATZ. which is widely distributed in Europe. *C. abietis* was probably mistakenly recorded from Honshu and Hokkaido in Japan by NIISIMA (1910) and HARADA (1928) but we can not yet find any specimens from Japan. It may be easily distinguished from *C. piceae* by its having very distinct elytral striae and shorter erect setae on interstices, which are two to four times as long as decumbent setae on streae on elytra in *C. abietis*.

According to KÔNO's original description, *C. hattorii* was separated from *C. piceae* by large and black body, close setae on prothorax and form of prothorax, but we cannot find these characteristics in the type specimens which are preserved in the Entomological Laboratory of Hokkaido University.

Cryphalus piceus EGGERS (Figs. 6 & 14)

Cryphalus piceus EGGERS, Ent. Blätt., 22, p. 132 (1926); STARK, Faune SSSR, 31, p. 268 (1952).

Body small, rather short oblong, subparallel-sided; testaceous to piceous-brown,

nearly opaque, densely hairy.

Head closely punctate, but impunctate laterally, vertex very finely reticulate, and sparsely ciliate; in female, frons slightly impressed transversely, punctate and shiny in middle; in male, frons with a shiny transverse laminate-carina on posterior portion of frons, slightly concave, shining, not closely punctate. Eyes oval, triangularly marginate at anterior margin. Antennal funicles four-segmented, clubs oval. Prothorax shorter than width at base, lateral sides gently narrowing anteriorly, frontal margin strongly rounded and with some (four to six) small tubercles just behind it, basal margin very narrowly rimmed and slightly wavy-edged, posterior angle rounded; disc strongly convex and again feebly prominent behind center, closely and finely granulate, rather sparsely situated comparatively thin and small tubercles on anterior two-thirds, clothed with long setae and scales. Scutellum small, triangular; surface rugose. Elytra slightly wider than base of pronotum, nearly three-fourths as wide as long, lateral sides almost parallel, strongly rounded at apex, humeral angles rounded; surface strongly convex and humeral elevations small, elytral striae not excavate and with punctures indistinct and never larger than on interstices, with minute and decumbent setae, interstices flat, closely and finely punctured, densely covered with relatively narrow scales and sparsely seriated long setae. Teeth of proventriculus not much widened laterally.

Body length: ca. 1.5 mm.

Hosts: *Picea jezoensis*, *Picea glehni*, *Picea excelsa*, *Pinus montana*.

Specim. ex.: Abuta (3 Exs., *Picea jezoensis*, June 5, 1951, M. INOUE; 13 Exs., *Picea jezoensis*, Sept. 26, 1952, M. INOUE; 9 Exs., Sept. 1, 1955, A. NOBUCHI), Usu (3 Exs., *Picea jezoensis*, June 6, 1951, M. INOUE), Chitose (4 Exs., July 28, 1956, H. YAMAGUCHI; 21 Exs., *Picea jezoensis*, May 26, 1954, H. YAMAGUCHI), Tomakomai (20 Exs., *Picea jezoensis*, July 5, 1954, H. YAMAGUCHI; 23 Exs., *Picea glehni*, July 5, 1954, H. YAMAGUCHI), Nopporo (21 Exs., July 3, 1936, M. INOUE; 21 Exs., *Pinus montana*, May 20, 1952, M. INOUE), Jyozankei (5 Exs., *Picea jezoensis*, April 7, 1949, M. INOUE), Kagura (2 Exs., July, 1956, A. NOBUCHI; 11 Exs., *Picea jezoensis*, July 7, 1956, H. YAMAGUCHI), Sounkyo (4 Exs., *Picea jezoensis*, June 5, 1954, H. YAMAGUCHI; 2 Exs., *Picea jezoensis*, Sept. 1956, H. YAMAGUCHI), Saruru (3 Exs., July 22, 1936, M. INOUE), Shari (6 Exs., Aug. 19, 1936, M. INOUE), Rikubetsu (40 Exs., June 16, 1936, M. INOUE), Nogami (2 Exs., *Picea glehni*, Aug. 27, 1942, M. INOUE), Lake Mashu (3 Exs., *Picea excelsa*, Aug. 7, 1949, M. INOUE), Pifuke (1 Ex., Aug. 20, 1956, A. NOBUCHI), Nakanayoro (13 Exs., *Picea jezoensis*, April 20, 1952, M. INOUE), Yamabe (2 Exs., *Picea excelsa*, July 19 1956, H. NISHIGUCHI; 41 Exs., *Picea jezoensis*, March 1 & 16, 1957, NISHIGUCHI; 10 Exs., *Picea excelsa*, April 25, 1957, H. NISHIGUCHI).

Habitat: Hokkaido, Siberia.

This species may be easily distinguished from other species by the following characteristics:

1. Body small (1.5 mm).
2. Elytra with evanished and no distinct striate punctures.
3. Prothoracic tubercles thin and small, and situated rather sparsely.
4. Prothorax large compared with elytra, such as in *C. laricis* NISHIMA.
5. In male with remarkable laminate-carina at frons.

***Cryphalus yamaguchii* n. sp.** (Figs. 7, 8, 12, 15 & 16)

Body oblong, cylindric, nearly parallel-sided; blackish-brown, not shining, covered with setae and scales on elytra.

Head minutely but distinctly reticulate, closely and rather strongly punctured, sparsely setiferous, setae over mouth long. In male moderately excavate horizontally at middle of frons, and weakly elevated longitudinally just before the excavation. Eyes oval, emarginate at anterior margin. Antennae reddish-brown, clubs slightly darkened, funicles three-segmented, second segment large, nearly equal to third and fourth together, clubs oval. Prothorax transverse, narrowing anteriorly, anterior border strongly rounded with about ten minute denticulations, posterior border very narrowly marginate, nearly bisinuate, basal corners rounded; disc strongly convex, and also rather strongly upheaved just behind middle; tubercles triangularly situated on anterior three-fourths, interspace of which distinctly granulated and with suberect setae. Scutellum nearly regular triangle; surface slightly convex, rugose. Elytra nearly as wide as base of pronotum, nearly three-fourths as wide as long, lateral sides nearly parallel and convergent, gently rounded at tip, humeral corners obtusely angulate; elytral striae indistinctly impressed but somewhat distinct laterally; upper surface strongly convex, humeral callosities indistinct, anterior half of middle with wave-like ruga, puncto-striae closely composed of rather fine punctures, interspaces finely but closely punctured, densely and short squamose and setiferous; the setae on interstices about three-fourths to two times as long as decumbent setae on striae.

Body length: ca. 1.5 mm.

Host : *Abies sachalinensis*.

Cotypes: 13 Exs., Sounkyo, Daisetsu-zan National Park, Hokkaido, Japan, Aug. 9, 1955, Coll. by Hiroaki YAMAGUCHI.

This new species is closely allied to *C. piceae* RATZ. in shape and structures, but may be distinctly differentiated by its having three-jointed antennal funicles.

We have great pleasure in associating with this species the name of Mr. H. YAMAGUCHI.

Explanation of the Plates

Plate 1.

- Fig. 1. *Cryphalus jezoensis* n. sp.
Fig. 2. *Cryphalus joholensis* MURAYAMA, after MURAYAMA (1940).
Fig. 3. *Cryphalus laricis* NIISIMA
Fig. 4. *Cryphalus niponensis* n. sp.
Fig. 5. *Cryphalus piceae* RATZ.
Fig. 6. *Cryphalus piceus* EGGERS
Fig. 7. *Cryphalus yamaguchii* n. sp.
Fig. 8. Proventriculus of *Cryphalus yamaguchii* n. sp.
 A. Teeth (Hakenzähne)
 B. Teeth of middle margin of masticatory plate (Zähne am medianen Kauplattenrand).

Plate 2.

- Fig. 9. Teeth of middle margin of masticatory plate of *Cryphalus piceae* RATZ.
Fig. 10. " *Cryphalus laricis* NIISIMA
Fig. 11. " *Cryphalus jezoensis* n. sp.
Fig. 12. " *Cryphalus yamaguchii* n. sp.
Fig. 13. " *Cryphalus niponensis* n. sp.
Fig. 14. " *Cryphalus piceus* EGGERS
Fig. 15. Tibia of *Cryphalus yamaguchii* n. sp.
Fig. 16. Antenna of *Cryphalus yamaguchii* n. sp.



