

Yasuiti MOMIYAMA* and Hiroshi HARA*: **The genus
Elaeagnus of Eastern Himalaya****

稲山泰一*・原 寛*: 東部ヒマラヤのグミ**

In 1825, D. Don recorded three species of the genus *Elaeagnus* from Nepal, namely *E. arborea* Roxb., *E. conferta* Roxb. and *E. umbellata* Thunb., but J. D. Hooker in Flora of British India Vol. 5 (1886) united the former two under *E. latifolia* L. In 1909 Servettaz in his elaborate monographic work reinstated *E. arborea* and *E. conferta* with several subspecies and varieties. Since 1960 the senior author has been studying the collections of the Botanical Expeditions to Eastern Himalaya organized by University of Tokyo, and validated *E. caudata* Schlecht. for an Eastern Himalayan species. In 1971 the junior author had an opportunity to examine some authentic materials of the genus in London, and noticed that some of the specific names have been misapplied.

Putting together the results of our recent studies, we recognize the following 6 species of *Elaeagnus* from Eastern Himalaya in the present paper.

We are very grateful to the authorities in the British Museum (Natural History), London, the Royal Botanic Gardens, Kew and the Linnean Society, London for enabling us to study the herbarium material and drawings in their charge. Particularly the junior author wishes to express his cordial thanks to Dr. W. T. Stearn of the British Museum for giving him valuable advice.

Clavis specierum varietatumque

1. Sempervirens. Flores autumnales.
2. Calycis tubus infundibuliformis, lobis longior. Flores pedicellati. Calyx extus adpresse dense argenteo-squamatus et ferrugineo-punctatus. Antherae filamentosae. Stylus glaber. Folia elliptica vel oblonga

* c/o Department of Botany, University Museum, University of Tokyo, Hongo, Tokyo. 東京大学総合研究資料館植物部門.

** 東京大学インド植物調査研究報告 No. 30.

- acuminata vel saepius subito anguste acuminata...3) *E. infundibularis*
2. Calycis tubus cylindricus.
3. Calycis tubus lobis longior. Calyx flavidus extus laxiuscule semistelato-squamatus. Stylus pubescens. Folia elliptica vel oblonga.
4. Antherae filamentosae exsertae, filamentis 0.5-1 mm longis. Flores parvuli 5-8 mm longi pallidi. Ovarium napiforme 1 mm longum...
.....1) *E. conferta*
4. Antherae subsessiles, filamentis minus 0.5 mm longis, semiexsertae. Flores majores 8-10 mm longi intensius colorati. Pedicelli distincti 4-5 mm longi2) *E. tricholepis*
3. Calycis tubus brevis, lobos subaequans acutangulus. Flores pedicellati. Antherae subsessiles. Folia angusta lanceolata.4) *E. caudata*
5. Calycis tubus lobos subaequans. Stylus glaber.var. *caudata*
5. Calycis tubus lobis paulo longior. Stylus laxe pubescens.
..... var. *aliena*
1. Decidua. Flores vernaes.
6. Calycis tubus brevis latior infundibuliformis, lobis depresso deltoideo-ovatis subito acuminatis. Fructus major oblongus 11-14 mm longus. Pedicelli elongati, in fructu 12-22 mm longi. Folia supra initio squamata.5) *E. Kanaii*
6. Calycis tubus anguste cylindrico-infundibuliformis, lobis longius ovato-deltoideis. Fructus minor fere ellipticus 6-9 mm longus. Pedicelli breves, in fructu 5-9 mm longi. Folia supra initio stellato-pilosa.....6) *E. parvifolia*

1) **Elaeagnus conferta** Roxburgh, Fl. Ind. ed. Carey, 1: 460 (1820); ed. 2, 1: 440 (1832)—Schlecht. in DC., Prodr. 14: 612 (1857), pro parte—Servettaz in Beih. Bot. Centralbl. Abt. 2, 25: 89, f. 5, 1-6 & 12 (1909), pro parte.

E. arborea Roxburgh, l. c. 1: 461 (1820); l. c. 1: 441 (1832), nihil aliud.

E. latifolia L. sensu Hooker f., Fl. Brit. Ind. 5: 202 (1886), pro parte.

Representative specimens:

Hort. Bot. Calc. (No. 1043, Dec. 1815—lectotype of *E. conferta* Roxb. in BM); *ibid.* (Wallich, no. 4025C, Dec. 1815, no. 1043 in KW, BM); *ibid.* (No. 1250, Sep. 1817—lectotype of *E. arborea* Roxb. in BM); *ibid.* (sub *E. dulcis* Roxb. in BM); (Wallich, no. 4025A sub *E. inferus* Hb. Roxb. in KW); Silhet

(Wallich, no. 4025B in BM, KW).

The name *Elaeagnus latifolia* L., Sp. Pl. ed. 1, 1: 121 (1753) was based on material from Ceylon. In the Flora of British India 5: 202 (1886) J. D. Hooker regarded as conspecific with this other plants from different parts of India, thus citing *E. conferta* Roxb. and *E. arborea* Roxb. as synonyms of *E. latifolia* and attributing to it a range extending from Ceylon northward to the Himalayas and also eastward to China. The plants of Eastern Himalaya are, however, distinguishable from those of southern India and Ceylon, i. e. *E. latifolia* sensu stricto, mainly in the shape of the leaves and flowers, as observed by the monographer Servettaz (1909).

In 1820 *Elaeagnus conferta* and *E. arborea*, both from Khasia, north-eastern India, were published in Roxburgh's posthumous Flora Indica, ed. Carey, 1: 460 & 461; since then the Eastern Himalayan plants have been referred to the one or the other by various authors. The British Museum (Natural History) possesses authentic specimens of these two species which were collected in the Royal Botanic Garden, Calcutta and identified by Roxburgh himself. There are excellent coloured Roxburgh drawings of these, complete with floral analyses, in the library of the Royal Botanic Gardens, Kew. Roxburgh's study of the group seems to have been largely based on plants cultivated in the Calcutta Botanic Garden.

The original description of *Elaeagnus conferta* Roxburgh is detailed and accurate, hence the species has been correctly interpreted by subsequent botanists. The specimens (one without locality, and one from Hort. Bot. Calcutta, no. 1043, Dec. 1815) named *Elaeagnus conferta* in Roxburgh's handwriting in the British Museum (Natural History), and also Roxburgh's drawing no. 1025 at Kew agree well with the description. Its flowers are clustered, slightly ferruginous, small and 5-6 mm long; its pedicels are 1-3 mm long; its calyx-tube is 3-3.5 mm long and inflated at the base; its calyx-lobes are about 2 mm long; its filaments are about 1 mm long, with oblong anthers about 0.8 mm long; and its style is hairy. The specimen (Hort. Bot. Calc.) named *E. dulcis* by Roxburgh (Hort. Beng. 11 (1814), nom. nud.) in the British Museum (Natural History) is also identical with *E. conferta*.

Unlike *E. conferta*, the name *E. arborea* Roxburgh was published with a very short and inadequate description which can be applied to any species

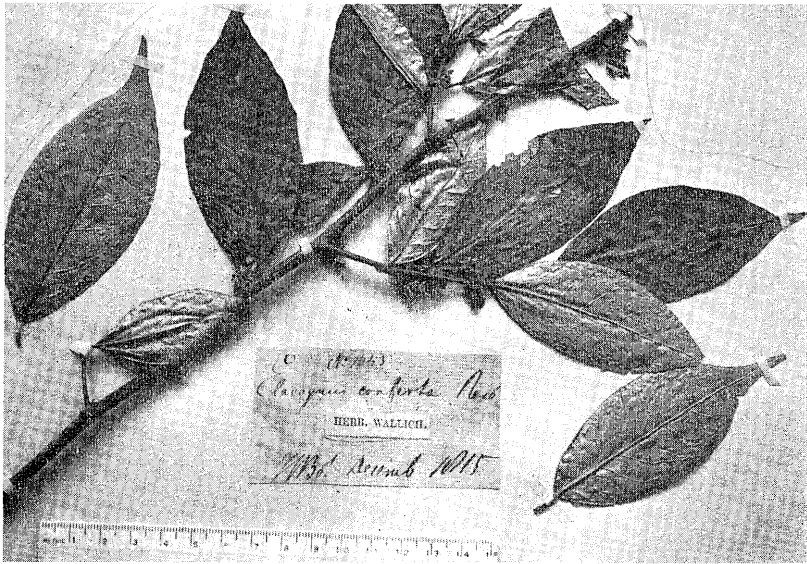


Fig. 1. *Elaeagnus conferta* Roxb. A part of the lectotype in BM.

of the group. He added that it is a large tree, native of the Garrow Hills and there called Shen-shong; flowering in December; the fruit, shaped like an olive, but much larger, is eaten by the natives when ripe, which is generally in March and April. Unfortunately no authentic fruiting specimen is found either in the British Museum or Kew.

The flowering specimens (one without locality, and one from Hort. Bot. Calc. no. 1250, Sept. 1817) named *Elaeagnus arborea* by Roxburgh in the British Museum (Natural History), and Roxburgh's drawing (no. 2430) of a flowering branch of *E. arborea* at Kew are not contrary to the short original description, and they are considered to be authentic material of the species. The specimens and the drawing agree fairly well with each other, especially in the shape of calyces and stamens, and the hairiness of style, although the colour of branches is lighter and the filaments are shown inserted slightly lower on the calyx-tube in the drawing as compared with the specimens. Judging from this material, *E. arborea* cannot be distinguished specifically from *E. conferta*.



Fig. 2. *Elaeagnus arborea* Roxb. The lectotype in BM.

Two specimens¹⁾ from Kumaon and Garhwal closely resemble *E. conferta*, but the flowers are larger and 6-8 mm long, the anthers 1-1.25 mm long, and the filaments 0.5-0.75 mm long. However, we could not confirm the occurrence of this species in Nepal, Sikkim, or Bhutan. Further materials are much needed for more critical studies.

1) Kumaon: Jeolikote, 4000 ft (N. Gill, no. 243, TI).

Garhwal: Siwalik & Jaunsar, Nakrunda (B. D. Sware, no. 110, TI).

2) *Elaeagnus tricholepis* Momiyama, sp. nov.

Ramuli graciliusculi, subangulati, squamis flavidis et fusciscentibus mixte-dense tecti. Folia elliptica vel obovato-elliptica vel rarius ovata, 7.3-8 cm longa 3.5-4 cm lata, acuminata, basi attenuata vel obtusa, chartaceo-coriacea, supra in sicco opaca, demum glabra, subtus argenteo-squamata, et squamis ferrugineis et rufescentibus sparsis conspersa, costa media elevata. Petioli 6-8 mm longi, sordide vel rufescenti-flavidocinerea. Flores majusculi, 8-10 mm longi, ex axillis foliorum 2-4-aggregati, cernui. Pedicelli 4-5 mm longi ferruginei. Ovarium fusiforme versus basin magis attenuatum ad 2.5 mm longum. Calyx flavidus in sicco intensius coloratus, extus laxiuscule semistellato-squamatus, squamis argenteis et rufescentibus mixtis centro-eximie umbonato, tubo calycis cylindrico-campanulato, 4-angulato, 6.5-7.5 mm longo, 3.5-5 mm lato, basi obtuso subconstricto, lobis calycis depresso-ovato-deltoideis breve acuminatis, 2.25-3 mm longis 2.5-3.5 mm latis, intus stellato-pilosis. Antherae subsessiles lineares 1.5 mm longae apiculatae, ex fauce tubi semiexertae, filamentis minus 0.5 mm longis. Stylus 9 mm longus, copiose stellato-pilosus, vix curvus, apice uno-latere stigmatosus.

Hab. Nepal: Godavari, Kathmandu, 5300 ft (A. D. Schilling, no. 1065, Sep. 24, 1966, fl. ex herb. Kew—type in TI).

A specimen, Chitre—Muktinath, 8200 ft (Mall, Shresta & Rajbhandri, no. 13817, Oct. 29, 1971, fl, TI), can also be referred to this species, but has more brownish flowers and more elongate leaves, as compared with the type.

3) *Elaeagnus infundibularis* Momiyama, sp. nov. (Fig. 3)

E. arborea Roxb. sensu D. Don, Prodr. Fl. Nepal. 67 (1825)—Wallich, Cat. no. 4027A (1831)—Schlecht. in DC., Prodr. 14: 611 (1857); in Linnaea. 30: 359 (1860), pro maj. part.—Servettaz in Beih. Bot. Centralbl. Abt. 2, 25: 70, f. 4: 4-9 (1909), pro maj. part.—Momiyama in Hara, Fl. E. Himal. 216 (1966); l. c. 2: 85 (1971).

E. armatus Hamilt. ex D. Don, l. c. 67 (1825), pro syn.

E. latifolia L. sensu Hooker f., Fl. Brit. Ind. 5: 202 (1890), pro parte.

Ramuli angulati, rufescenti-argentei, annotini fusciscenti-cinerei, vetustiores fusci. Folia sempervirentia, elliptica vel oblongo-elliptica, apice acuminata vel saepius subito angusteque acuminata, basi obtusa vel rarius acuta, adulta chartacea, supra glabra, subtus argentea et squamis rufescentibus sparsis punctata. Petioli 0.9-12 mm longi, argenteo- vel rufescenti-

squamati. Flores auctumnales, in axillis foliorum 1-3-aggregati. Pedicelli graciles, 3 mm longi distincti. Ovarium fusiforme basi magis attenuatum ca 3 mm longum. Calyx extus dense adpresse argenteo-squamatus et squamis ferrugineis superpositis punctatus, tubo calycis infundibuliformi, rarius cylindrico, 4-angulato, 7-8 mm longo, sub lobis 3.75-4 mm lato, basi vix constricto, lobis calycis sub anthesi erectopatulis, ovato-deltioidis, apice acuminatis vel breviter acuminatis, 4-4.5 mm longis 3 mm latis, basi subauriculatis, intus stellato-pilosis. Antherae late lineares, 1.8-2 mm longae, exsertae. Filamenta ad faucem tubi inserta, erecta, 1-1.5 mm longa, apice magis minus incurva. Stylus glaber, ca. 9 mm altus. Fructus magnus, ovalis vel oblongus, basi apiceque rotundatus, 16-18 mm longus, 9-11 mm latus, squamis majusculis minus laceratis argenteis et rufescentibus mixte indutus. Nux anguste oblonga, apice attenuata, basi vix constricto attenuata, pallide brunnea, opaca, octo-costata, costis dorso sulcatis. Pedicelli in

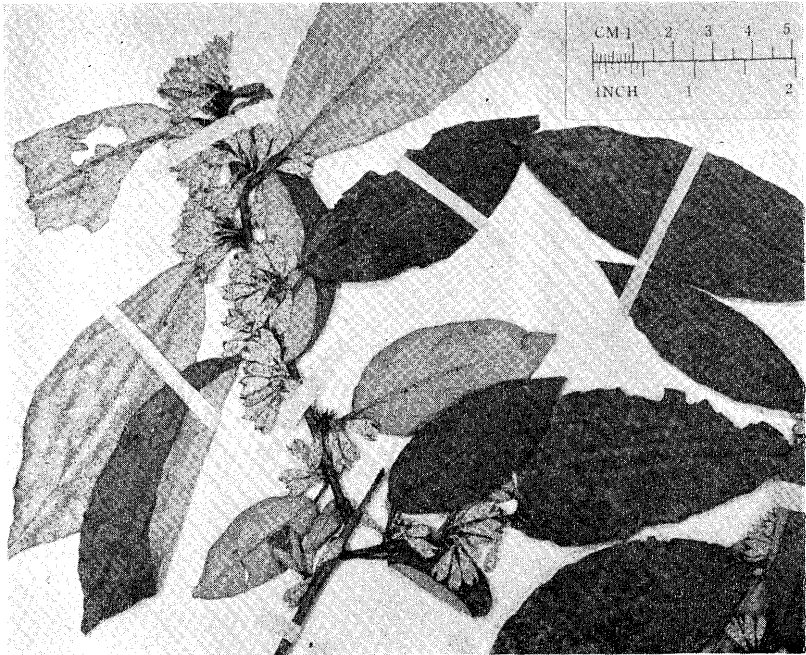


Fig. 3. *Elaeagnus infundibularis* Momiya. A part of Nicholson, no. 2764 in TI.

fructu potius breves 7-11 mm longi graciles cernui vel penduli, argenteo-vel rufescenti-squamati.

Representative specimens :

Nepal: Kakani, Kathmandu (H. Kanai, no. 674486, Dec. 16, 1969, fl.—type in TI); Narainhetty (Hamilton as *E. armatus*, Nov. 22, 1802, BM); Chooshe (Wall. ?, BM); Napalia (Wallich, no. 4027A, 1820 & 1821, KW); Godavari, Kathmandu, 5300 ft (Schilling, no. 708, Dec. 20, 1965, K, TI); Bagmati Zone, Sheopuri Range, 2000 m (Nicholson, no. 2764, Nov. 17, 1966, US, TI, BM); Tharpu—Chyangthaphu, 12-1300 m (Kanai et al., Nov. 26, 1963, TI).

Darjeeling (Griffith, K).

Bhutan (Griffith, no. 2490, BM; no. 2491, K); Tsarza La—Ritang, 2000 m (Hara et al., Apr. 11, 1969, TI); Tinlegang, 1950 m (Kanai et al., May 4, 1967, TI); Mishichen—Khosa, 1600-1800 m (Kanai et al., May 10, 1967, TI).

Distr. East Himalaya (Nepal, Sikkim, Bhutan).

The plants of Nepal referred to *E. arborea* by D. Don, Wallich, Schlechtendal and Servettaz clearly differ from *E. conferta* (including *E. arborea*) above-mentioned in having larger flowers, which are 7-9 mm long and silvery with scattered brown dots, infundibuliform calyx-tube narrowed to the base and 4-5 mm long, calyx-lobes 3-4 mm long, filaments about 1.4 mm long, and anthers about 1.8 mm long, and glabrous style. It is interesting to note that there is a sheet of this Nepalese plant in the British Museum which was marked as '*Elaeagni* sp.' by Roxburgh, and was not identified as either *E. conferta* or *E. arborea* by him.

4) ***Elaeagnus caudata*** Schlecht. [ex Jackson, Ind. Kew. 2: 825 (1893), nom. nud.—Servettaz in Beih. Bot. Centralbl. Abt. 2, 25: 26, f. 6-20 (1909), nom. nud.] ex Momiyama in Hara, Fl. E. Himal. 2: 85, f. 7 (1971).

E. conferta Roxb. sensu Momiyama in Hara, Fl. E. Himal. 1: 217 (1966).

Descriptio fructus emendata: Pedicelli in fructu graciles 0.9-1.1 cm longi (non 2 cm longi).

var. **aliena** Momiyama in Hara, Fl. E. Himal. 2: 87 (1971).

Distr. sp. E. Himalaya (Nepal, Sikkim, Bhutan).

5) ***Elaeagnus Kanaii*** Momiyama, sp. nov. (Fig. 4)

Ramuli hornotini angulati, 2 mm in diametro, squamis argenteis centro umbonato flavescente tecti, annotini fuscescentes vel flavido-fuscescentes, vetustiores denudati, atro-purpurei vel flavido-fuscescentes, medulla brunnea.

Folia decidua, latiora elliptica vel ovato-elliptica vel rarius obovato-elliptica, apice acuminata, basi obtusa vel acuta, 5.1×2.5 , 6.9×3.5 , 7.6×3.1 cm magna angustiora oblonga vel obverse oblonga, apice longe attenuato-acuminata, basi acuminato-attenuata, chartaceo-membranacea, supra opaca, luteo-viridia, initio argenteo-squamata demum glabra, subtus argenteo-squamata et squamis fulvescentibus sparsis conspersa, costa media flavido-argentea elevata, nervis lateralibus ca. 5, graciliter elevatis sursum arcuato-ascendentibus. Petioli 8-16 mm longi, graciles, argentei et squamis flavescentibus mixte tecti. Flores vernaes, minores, copiosi, ex quaque axillis foliorum 1-3-fasciculati, cernui. Pedicelli 8-10 mm longi, graciles. Ovarium ellipsoideum, 2-3 mm longum, utrinque attenuatum. Calycis tubus brevis latior infundibuliformis, 4-angulatus, 3.5-4.5 mm longus, sub lobis 1.5 mm latus, basi ad collum ovarii subito attenuatus, lobis calycis depresso deltoideo-ovatis, subito acuminatis, intus stellato-pilosis. Antherae lineari-oblongae, 1.8 mm longae, apiculatae, ex fauce calycis exsertae. Filamenta brevissima 0.5 mm longa, erecta, sursum inclinata. Stylus ca. 8.5 mm longus, copiose stellato-pilosus, apice curvus, ubi uno latere stigmatosus. Fructus ellipsoideus

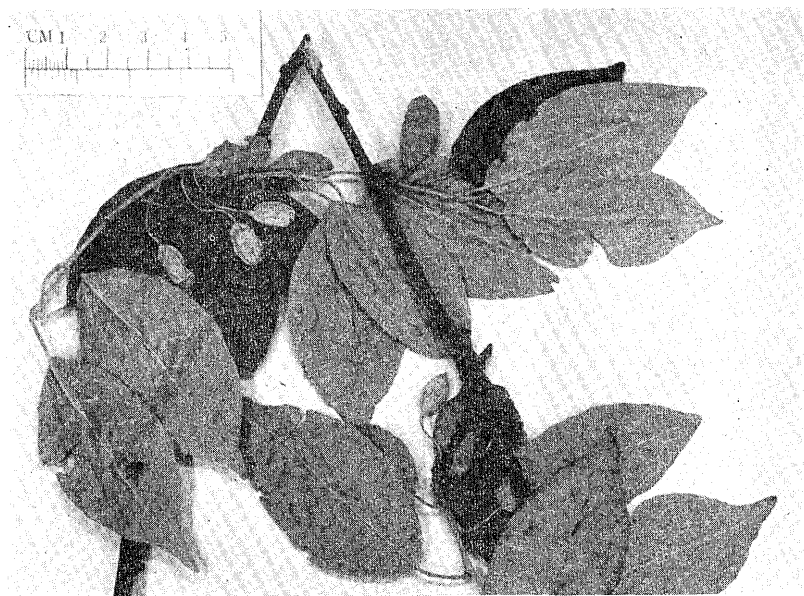


Fig. 4. *Elaeagnus Kanaii* Momiyama. A part of the holotype in TI.

vel oblongo- vel ovato-ellipsoideus, 1.1-1.4 cm longus, 5.5-8 mm latus, argenteo-squamatus et squamis fulvescentibus paucis sparsis mixte indutus, apice stylo reciduo brevi-apiculatus vel non apiculatus. Nux oblonga vel ovato-oblonga, versus apicem attenuata, basi constricta attenuata, flavido-brunnea, octo-costata, costis dorso sulcatis. Pedicelli in fructu elongati, gracillimi, 1.2-2.2 cm longi, squamis argenteis centro flavescente tecti.

Hab. Nepal: Chilime—Kilojet, 1800 mm. (Kanai & P. R. Shakya, no. 68, Jun. 28, 1970, fr.—type in TI); *ibid.* (Kanai & P. R. Shakya, no. 672088, fr., TI); Jumla, 7600 ft. (Polunin, Sykes & Williams, no. 4521, July 3, 1952, fr., BM); Tarakholagaon (W. of Beni), 8000 ft. (Stainton, Sykes & Williams, no. 181, Apr. 24, 1954, fl., BM).

6) ***Elaeagnus parvifolia*** Wallich [Cat. no. 4026 (1831), nom. nud.] ex Royle, Ill. Bot. Himal. Mts. 323, t. 81, f. 1 (1836)—Schlecht. in DC., Prodr. 14: 612 (1857)—Momiya in Hara, Fl. E. Himal. 2: 87 (1971).

E. umbellata Thunb. sensu D. Don, Prodr. Fl. Nepal. 68 (1825)—Hooker f., Fl. Brit. Ind. 5: 201 (1886).

E. umbellata subsp. *parvifolia* (Wall.) Servettaz in Bull. Herb. Boiss. ser. 2, 8: 383 in clave (1908); in Beih. Bot. Centralbl. Abt. 2, 25: 55 (1909).

E. umbellata var. *parvifolia* (Wall.) C. K. Schneider, Ill. Handb. Laubholz. 2: 411 (1909).

E. orientalis L. sensu Murray ex Rechinger, Fl. Iran. Elaeagnac. 3 (1968).

E. umbellata f. *parvifolia* (Royle) Kitamura in Act. Phytotax. Geobot. 25: 39 (1972), quoad syn.

Distr. Afghanistan, Himalaya, Assam and W. China.

E. Murray (1968) adopted *E. orientalis* L. in the sense of *E. parvifolia* Wall. ex Royle based on the Linnean specimen, but we cannot agree with his opinion. The specimen of *E. orientalis* in the Linnean Herbarium (No. 160.2) in London is a sterile one. Its leaves are oblong, roundish at the apex and round at the base especially in the upper ones, sparsely and minutely stellate-hairy above with 7-10-radiate ascending hairs, and silvery grey beneath densely covered with ascending stellate hairs (not lepidote). Some specimens which well agree with Linnean type are found in Iraq, for example Baghdad (F. A. Rogers, no. 0264 in Kew). These specimens are quite different from *E. parvifolia* of Himalaya especially in the shape and indumentum of leaves.

Elaeagnus parvifolia of Himalaya is closely allied to *E. umbellata* Thunberg of Japan, and, in order to discuss the relationship, we need more ample material from West China. However, so far as the materials at our disposal are concerned, the Himalayan plants have leaves always minutely stellate-hairy above, narrower calyx-tube, minutely apiculate anthers, copiously stellate-pilose style, and more silvery branchlets.

* * * *

東部ヒマラヤ産のグミ類を再検討した結果6種を認めた。このうち常緑秋咲きの仲間は4種である。これらは *Elaeagnus conferta* Roxb. 或は *E. arborea* Roxb. にあてられてきたが Roxburgh の基準になる標本を検討し、この兩名は同一物をさしておりその基準形は Khasia 産で東部ヒマラヤにはないことを明らかにした。しかし Kumaon 地方に近い形が見出されたが資料が不十分で断定できない。東部ヒマラヤで *E. arborea* と呼ばれてきた一種は漏斗形の花をつけ *E. infundibularis* Momiyama と名付けた。

落葉春咲きの仲間には2種ある。*E. parvifolia* Wall. ex Royle はアキグミに近いが、若葉の上面には常に細かい星状毛が密生し、萼筒はより細く、葯の先端は微凸頭、花柱には星状毛が常に多く、小枝は白っぽい。最近 *E. orientalis* L. が本種であるとの説も出されたが、リンネの基準標本を検したところ毛の性質など全く異なり明らかに別物である。

他の *E. Kanaii* Momiyama と命名した一種は、若葉は上面も鱗片でおおわれ、萼筒はやや漏斗形で太く、果実は大きく楕円形で長さ 11-14 mm, 果梗は長く 12-22 mm に達する。

□Eilif Dahl & Hildur Krog: **Macrolichens of Denmark, Finland, Norway, and Sweden.** 185 pp. Scandinavian University Books, Oslo. 1973. 46 ノルウエー・クロネ。本書はスカンジナビア産の大型地衣類の検索表を主体としたものであるが、日本産の北方系地衣類の検索にも参考になるので紹介する。1967年にイギリス地衣学会が主催して、国際地衣類採集会をノルウエーとスウェーデンで行なった時に、著者が案内のために作った検索表をもとにし、それに、形態、分化、化学等についての簡単な解説を加えて印刷したものである。最初に、本書で扱った45属の検索表、次いで各属について種の検索表があげてある。かなりのスペースをさいて、ずい所に線画が入れてあるが、これらの図は検索のためにとくに役立っていると思えない点が惜しまれる。しかし、著者等が数年間にわたって実際に使用し、検討を加えた検索表であるから、検索上間違いをおこしそうな点については充分配慮されている。(黒川 道)