NOTES RELATING TO THE FLORA OF BHUTAN: I

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ABSTRACT. An outline of the history, scope and present achievements of the Bhutan Flora Project is submitted. The present paper deals with some of the problems that have been resolved in Solanaceae, Boraginaceae and Lauraceae. The following new combinations and subspecies in these families are made: *Leucophysalis yunnanensis* (Kuang & Lu) Averett subsp. *bhutanica* Grierson & Long; *Mandragora caulescens* Clarke subsp. *flavida* Grierson & Long, subsp. *purpurascens* Grierson & Long and subsp. *brevicalyx* Grierson & Long; *Onosma bhutanica* (Johnston) Grierson & Long and *Litsea nervosa* (Kurz) Grierson & Long. The delimitation of *Microula sikkimensis* (Clarke) Hemsl. from *M. trichocarpa* (Maxim.) Johnston is reviewed. *Lindera heterophylla* Meissn. and its allies are discussed and a new species, *L. praetermissa* Grierson & Long, is described from Eastern Tibet and adjoining countries.

The Bhutan Flora Project

This project was set up at the behest of the Royal Government of Bhutan which in 1974 requested that an inventory of the flora of their country, intelligible to foresters and those interested in natural resources, should be drawn up. The scheme is supported financially by the British Ministry of Overseas Development and was actively brought into being in 1975. The research work up to the present has been carried out entirely by the authors in consultation with experts on various families and genera and is conducted primarily from the Royal Botanic Garden, Edinburgh.

The form that the inventory will take is that of an annotated check-list in which all recorded species will be enumerated, but those of greater importance, either from a botanical standpoint or because they are commoner, will receive longer descriptive notes (usually 6–7 lines, rarely 10–12) than those less significant or rare. Keys will be provided to genera but not to the constituent species where it is hoped that the notes will be sufficiently discriminating to permit identification (in large genera it is intended that the species should be divided into smaller more manageable groups on the basis of some prominent common feature). Key characters, calling for a greater competence than can be provided by a hand lens, will be avoided where possible and the literary style throughout is designed to be simple and without unnecessary botanical terminology. As it is intended for use in Bhutan, synonymy in the check-list has been reduced to a minimum, relating only to Hooker's *Flora of British India* and to recent work on Himalayan botany. There will be no citation of specimens (though a card index recording all Bhutanese specimens examined is being maintained) but the districts of Bhutan from which each species is known together with flowering times and altitudinal ranges will be recorded in the check-list. Line drawings, as an aid to identification, will accompany some families with complicated floral or fruiting parts. This standard of treatment has been specially chosen so that the bulk of the work may be completed by two workers in the four years allotted. As with all such projects, problems of taxonomy arise, some of

which, the major ones, can only be resolved by monographic study. The lesser ones which may be clarified by a little study and application will be reported from time to time under the above title and will reflect some of the families that have been researched in the course of this project.

Estimates of the size of a flora can at this stage only be approximate and much must depend upon the liberality with which species limits have been drawn and the level of synonymy involved. From existing collections some authorities reckon the flora of Bhutan at 4000 species, others would double this figure; possibly 5000 species is more realistic but even this may be excessive. In the course of working through a number of plant families it became obvious that there is much in common between the floras of Sikkim and Bhutan: the species from the former may be expected in the latter and their absence there in many cases indicates a lack of collection. By comparison with its western neighbour, Bhutan is to some degree under-collected and much of the collecting that has been done was motivated by horticultural interests which lay in securing handsome additions to temperate Western gardens. It has therefore been decided that, to make the check-list more comprehensive and more valuable botanically, its scope must be enlarged to include species from Sikkim that have not so far been recorded from Bhutan; these, however, will only merit very brief treatment. As well as records from Sikkim, those from the Chumbi Valley, S Tibet, the Darjeeling-Kalimpong area of N Bengal and the Nyam Jang Chu Valley to the east of Bhutan, will be included.

In 18 months of study preliminary accounts of 100 families, the delimitation of which approximates to those of the Englerian system, have been worked up. These encompass somewhat over 1000 species for which descriptions have been written, although the number of species names considered and reduced to synonymy is much in excess of this figure. Most of these families are woody and tropical in distribution, e.g. Araliaceae, Rubiaceae, Apocynaceae, Asclepiadaceae, Verbenaceae, Euphorbiaceae and Moraceae, but some of the larger, more herbaceous and temperate families such as Ranunculaceae Cruciferae, Compositae, Scrophulariaceae and Primulaceae, etc. have yet to be tackled. The term "preliminary" here implies that literature and herbarium records available at Edinburgh have been searched and that descriptions of species, keys to genera and applicable family descriptions have been compiled from this study. These preliminary accounts must then undergo further comparison at Kew (K) and at the British Museum (BM), herbaria which together with that at Edinburgh (E) contain large representative collections from Bhutan made by Griffith, Cooper and Ludlow & Sherriff (and their co-collectors). These three institutions also hold type material of virtually all species of the Himalayan flora and hence provide a very sound foundation for a floristic study of Bhutan. Before these preliminary accounts become finalised, however, the collections made by the botanists from the Botanical Survey of India between 1963 and 1965 which are housed at the Indian Botanic Garden, Calcutta (CAL) and those collected by the staff of Tokyo University (TI) must be examined. Summaries of these and earlier collections may be found in Dr K. Subramanyam's *Materials for the Flora of Bhutan* (1973) and in the *Flora of Eastern Himalaya* (1966) compiled by Prof. H. Hara, especially the *Second Report* (1971), which enumerates and discusses the botanical results of the six-man team of Japanese botanists who

visited Bhutan in 1967. Other works giving a valuable insight into the history of botanical collection in the Eastern Himalaya are to be found in Fletcher (1975) and Stearn (1976).

The floristic works among those cited above, as well as that by A. M. Cowan & J. M. Cowan (1929), are enumerations of species or only partially descriptive. Our work will be the first independent reassessment of the entire vascular plant flora of Sikkim and Bhutan giving keys to families and genera and with short comparative descriptions of species since Hooker's *Flora of British India*, which of course included the whole of India, Ceylon, Burma and Malaya.

A brief plant collecting trip was made by the authors to West Central Bhutan in June 1975 but further expeditions planned for 1976, 1977 and 1978 have so far been frustrated by restrictions upon entry into Bhutan. It is hoped, however, that further field work in that country may be possible before the end of the project, especially in the southern foothills which at present are under-collected. In many species the problems of critical differentiation would be more easily resolved in the field than in the herbarium and supplementary knowledge of ecology, local names and uses of plants is badly needed.

In addition to the present efforts, a check-list of gymnospermous and monocotyledonous families (except Gramineae and Cyperaceae) from Bhutan drawn up by the late Mr J. E. Dandy has been made available through the kindness of the Keeper of the Botany Department at the British Museum and will provide a useful basis for the future study of these families.

As an ancillary project, a record is being maintained of W. Griffith's large collection made in Bhutan in 1838, the specimens of which were widely distributed to herbaria. Unfortunately, however, three different systems of numbers operate in the collection; these must be correlated as the published field notes to which these numbers eventually relate are often full and valuable. It is hoped that in the course of our studies the list of numbers and the modern names for the plants that Griffith collected can be brought together and published separately.

SOLANACEAE

Leucophysalis

Leucophysalis yunnanensis (Kuang & Lu) Averett subsp. **bhutanica** Grierson & Long **subsp. nov.** a subsp. *yunnanensis* corolla rotato-campanulata, lobis 6–7 mm longis differt.

BHUTAN: Rinchu—Kancham, 5000 ft, 2 vi 1915, *Cooper* 3943* (holo. E; iso. BM).

The detailed illustration of *Physaliastrum yunnanense* Kuang & Lu accompanying the revision of this genus by these authors (1965) clearly shows that in the typical plant the lobes are probably 3–4 mm, representing by proportion only about a third of the corolla length. The lobes of the corolla in Cooper's specimen are clearly longer as stated above but in respect to fruit and more especially details of the fruiting calyx the two subspecies seem indistinguishable.

* All the specimens cited have been examined by the authors.

This is the first occasion that this genus, which bears a superficial resemblance to *Solanum*, especially *S. nigrum* L., has been recorded from the Himalayas. It differs from *Solanum* in that the anthers are not coherent and dehisce by longitudinal slits, and in the fruit, the accrescent acutely muricate calyx closely invests the berry and wholly or partially encloses it.

A broad concept of the genus *Leucophysalis* has been taken on the advice of Dr J. E. Averett, University of Missouri, St. Louis, USA, to whom the authors are duly grateful. See also Averett (1977).

Mandragora

Mandragora caulescens C. B. Clarke in Hooker, Fl. Brit. Ind. 4:421 (1883).

This species usually inhabits open stony hillsides and screes along the Himalayan range and in the mountains of Western China where its thick elongated tap roots are able to infiltrate the rocky substrate; only rarely does it appear to be found in woodland or in marshy soil. Mature leaves are oblanceolate or spathulate, 7–15 × 2–6 cm, with apex acute or obtuse, base attenuate ± sessile, margins entire and decurrent on the stem. Flowers are borne more or less at ground level in the axils of the lower bract-like leaves of the young shoots and begin to open in May. Peduncles measure 5–10 cm and bear a solitary 5–6-merous pendulous flower above the developing leaves. Calyx and corolla are campanulate and of almost equal length except apparently in some Tibetan plants (see below). The anthers are free and dehiscence is by longitudinal slits. The globose ovary is surmounted by a thin style bearing a bilobed capitate stigma. Fruit is a globose berry usually surrounded by the persistent calyx. As flowering progresses and the plants pass into the fruiting condition, the stem continues to grow so that the flowers at length appear to be borne at the base of a leafy stem 7–35(–60) cm.

On examining the specimens from Bhutan there appeared at first sight to be two species: one consisting of smaller plants with yellow flowers 1–1.5 cm long, e.g. *Ludlow, Sherriff & Hicks* 18986 (BM—from Upper Bumthang Chu, E Bhutan), the other consisting of larger plants with purple flowers 2–2·5 cm long, e.g. *Ludlow, Sherriff & Hicks* 20645 (BM, E—from Shingbe, Me La, E Bhutan). In this context, *Ludlow, Sherriff & Hicks* 16139 (BM, E—from Cheli La, W Bhutan) being a smaller plant with purple flowers 1–1·5 cm long would appear to be intermediate between the two. Clearly a wider examination of material was called for and indeed, such is the variation, it seems surprising that this species has not been the subject of comment before.

So far as herbarium records show, the species extends from W Nepal (longitude 82° E) along the Himalayan range into SE Tibet and NE Upper Burma and finally into Yunnan and Szechwan in W China as far east as longitude 102° (see fig. 1). The plants from the eastern and western ends of this distribution tend to show a concentration of the extremes of variation; that is, all the specimens from W Nepal are small plants with small yellow flowers whereas those from W China are generally larger plants and tend to have large purplish or often dark purple flowers. Plants from Central and E Nepal, Sikkim and to some extent from Bhutan are intermediate, although some identical or closely similar to the extremes do occur in Bhutan as shown above. It could be argued that the extremes which appear to be more or less stable populations are two closely allied species and that the intermediates

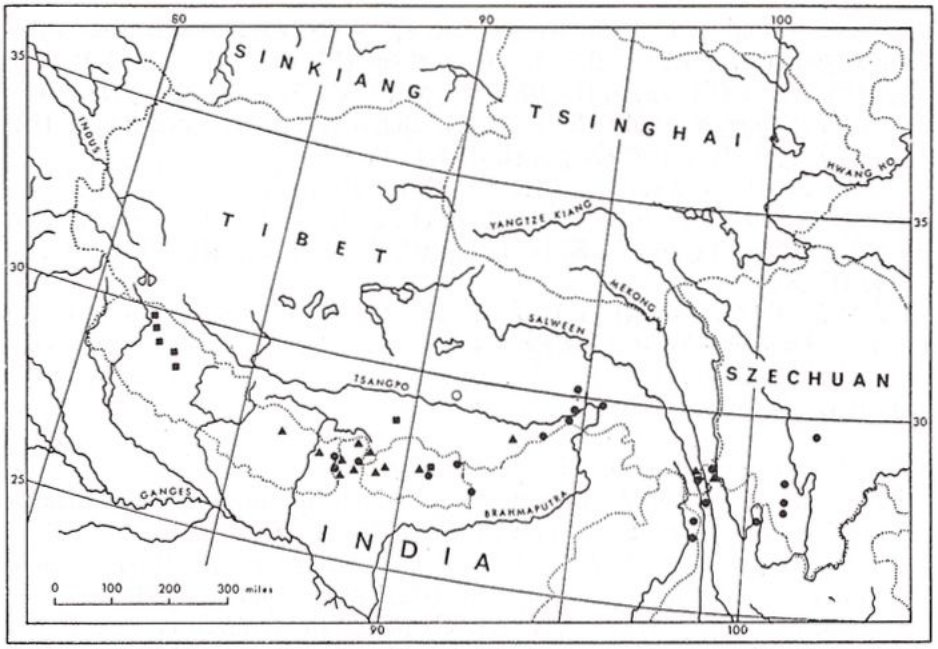

FIG. 1. Distribution of the subspecies of *Mandragora caulescens*: ■ subsp. *flavida*; ● subsp. *purpurascens*; ▲ subsp. *caulescens*; ○ subsp. *brevicalyx*.

represent a range of hybrids between them. But such is the range of intermediates that this view is rendered untenable —in such a situation of hybridity the syntypes of *M. caulescens* (Sikkim, 12–13000 ft, *J. D. Hooker* s.n., K) which are small-flowered purplish plants would be mere hybrid examples, the name *M. caulescens* then having little relevance. It seems preferable, therefore, to regard the two extremes as subspecies of *M. caulescens* which are described below and, as it is a nomenclatural necessity to retain the title subsp. *caulescens*, it may be used as a convenient name for the plants that are intermediate in some respects between the two extremes.

M. caulescens C. B. Clarke subsp. **flavida** Grierson & Long **subsp. nov.** a subspecie typica differt e basi caule ad summum florium 7–15 cm alti, floribus constanter 5-meris c. 1 cm longis corollis flavis in lobos rotundatos quarto vel tertio parte divisis, filamentis staminum 3·5–5·5 mm longis, antheris 2–3 mm longis.

NEPAL: Pass NW of Jumla, 6 miles Pansae Dara, 10,000 ft, April 1952, *Polunin, Sykes & Williams* 878 (holo. BM; iso. E), 4250 (BM, E), 4668 (BM, E), 4696 (BM, E); *Stainton* 4263 (BM, E); *Einarsson et al*, 430 (BM); *Dobremez* 175 (BM).

BHUTAN: *Ludlow, Sherriff & Hicks* 18986 (BM).

TIBET: *Walsh* 113 (K).

M. caulescens C. B. Clarke subsp. **purpurascens** Grierson & Long **subsp. nov.** a subspecie typica differt e basi caule ad summum florium (10–)15–35 cm, floribus 5–6-meris, 1·5–2·5 cm longis, corollis purpurascentibus vel intense purpureis, in lobos oblongos vel spathulatos dimidio divisis, filamentis staminum 7–10 mm longis, antheris 3–4·5 mm longis.

YUNNAN: W flank of Lichiang Range, Lat. 27° 20′ N, 10–11,000 ft, June 1910, *Forrest* 5999 (holo. E; iso. BM, K), *Forrest* 569 (E), 10474 (E, BM, K); *Rock* 3597 (E), 22771 (E), 24750 (E, BM), 25005 (E, BM); *T. T. Yu* 19078 (E).
SZECHWAN: *Forrest* 21407 (E, BM, K), 28416 (E, BM); *Rock* 17530 (E); *Schneider* 3501 (E, K); *Pratt* 755 (BM, K).
NE UPPER BURMA: *Forrest* 26951 (E, K); *Farrer* 1694 (E).
E TIBET: *Ludlow, Sherriff & Taylor* 3776 (E, BM), 4591A (E, BM); *Ludlow, Sheriff & Elliot* 13149 (E, BM), 13750 (E, BM), 15051 (E, BM); *Forrest* 19630 (E, K).
SIKKIM: *King's Coll.* s.n. (E, K); *W. W. Smith* 4593 (E); *Cooper* 759 (E).
BHUTAN: *Ludlow, Sheriff & Hicks* 20645 (E, BM); *Bowes Lyon* 3239 (BM).
NEPAL: *Williams* 700 (BM).
ASSAM: *Ward* 13840 (BM).

M. caulescens C. B. Clarke subsp. **caulescens**

This consists of plants which are intermediate in stature, flower size or colour between subsp. *flavida* and subsp. *purpurascens*
NEPAL: *Beer* 8264 (BM); *Dhwoj* 513 (E, BM); *Gardner* 479 (BM); *Polunin* 631 (BM); *Stainton* 254 (E, BM), 4676 (BM); *Zimmerman* 688 (BM).
SIKKIM: Clarke 34977 (K), 46387 (K); *Cooper* 533 (E); *Hara et al* 5352 (K, BM); *Hooker & Thomson* s.n. (syntypes of *M. caulescens*, K); *Lace* 2266 (E); *Rhomoo* 210 (E), 1059 (E); *Ribu & Rhomoo* 5492 (E); *Watt* 5373 (E, K).
BHUTAN: *Bowes-Lyon* 3156 (BM); *Cooper* 3232 (E); *Gould* 109 (K); *Ludlow & Sherriff* 107 (BM), 3073 (BM); *Ludlow, Sherriff & Hicks* 16139 (E, BM), 19040 (BM).
TIBET: *Bor & Kirat Ram* 20511 (K); *Ludlow & Sherriff* 1590 (BM).
YUNNAN: *Maire* 462 (holotype of *Mairella yunnanensis* Lévl., E); *Ward* 113 (E); *T. T. Yu* 19843 (E).

Two collections from Lhasa appear to represent a somewhat different *Mandragora* with shorter calyx lobes. It is allied to subsp. *flavida* in its stature and flower colour and is possibly best treated at present as another subspecies of *M. caulescens*.

M. caulescens C. B. Clarke subsp. **brevicalyx** Grierson & Long **subsp. nov.** a subspecie typica differt calyx sub anthesin 5–7 mm longa, fructifero 9–11 mm longa, corolla flava c. 11 mm longa in lobos oblongos dimidio parte divisis, filamentis staminum c. 4 mm longis, antheris 1·5 mm longis.
TIBET: Hills S of Lhasa, 14,500 ft, June 1942 (in flower), *Ludlow & Sherriff* 8676 (holotype BM); *ibidem*, 15,500 ft, August 1942 (in fruit), *Ludlow & Sherriff* 9014 (E, BM). Further collections from this area are desirable to assess the variability of this taxon and its true relationship to the rest of the species.

By contrast with its European cogener, *M. officinarum* L., this species has aroused little comment. Apart from Clarke's original description the only person who appears to have written about it is W. W. Smith (1913, p. 399) who stated that the fruits of plants from Gnatong Chu, Sikkim were "5 cm diam. and calyces enlarged to nearly 4 cm long". Herbarium specimens so far examined have not revealed a berry larger than 1·5 cm diam. nor a fruiting calyx longer than 2·5 cm.

BORAGINACEAE

Microula

Microula sikkimensis (Clarke) Hemsl. and **M. trichocarpa** (Maxim.) Johnst.

While restricting *Microula* to *M. tibetica* Maxim., Brand (1931, p. 25) indicated that he regarded *M. sikkimensis* as a synonym of *M. trichocarpa* which he also relegated to its original station as *Omphalodes trichocarpa* Maxim. Johnston (1928, p. 83) stated that *M. trichocarpa* was a *Microula* related to *M. myosotidea* without reference to *M. sikkimensis*, a well represented Himalayan species. Whereas recent authors have followed Brand in uniting the two species as *M. trichocarpa* they have followed Johnston (1924, pp. 61–62) in the interpretation of genera and, clearly, the nutlets of the two species resemble more closely those of *M. tibetica* Maxim. than those of *O. verna* (L.) Moench, respectively the types of the two genera.

M. sikkimensis, however, is quite distinct from *M. trichocarpa*. The latter is generally a more slender plant with a smaller corolla limb, 4–6 mm as against 6–10 mm in *M. sikkimensis*, but the two can best be separated in fruit. The nutlets of both are about the same size 2·5–2·75 mm but the areole on the dorsal surface (together with its rim) is about half as long as the nutlet in *M. sikkimensis* whereas in *M. trichocarpa* it occupies more than three quarters of its length. The calyx surrounding the nutlets is also different: in *M. sikkimensis* the segments are oblong, c. 3 mm, and obtuse but in *M. trichocarpa* they are triangular, 4–5 mm, and acute.

M. trichocarpa appears to be confined to Kansu and Szechwan in W China and may also be present in Yunnan, but after examining a large suite of material, it may be concluded that it is not indigenous in the Himalayas. *M. sikkimensis*, on the other hand, is distributed from Nepal eastwards to Yunnan and Szechwan.

Onosma

The characters by which Johnston (1954, pp. 78–81) sought to differentiate *Maharanga* from *Onosma* seem to us to delimit it rather as a section of the latter and for the purposes of the Bhutan flora it is more convenient to treat the whole as one genus. The following combination is therefore necessary:

Onosma bhutanica (Johnston) Grierson & Long **comb. nov.**

Basionym: *Maharanga bhutanica* Johnston in Jour. Arn. Arb. 37:301 (1956).

LAURACEAE

Lindera

Notes on **Lindera heterophylla** and its allies.

Both *L. heterophylla* Meissn. & *L. cercidifolia* Hemsl. have been recorded from Bhutan by Hara (1971, p. 38). Doubts that more than one of these species was indigenous to Bhutan have led us to examine closely Himalayan, Chinese and Japanese material of this group of *Lindera* species, the leaves of which are sometimes trilobed (see fig. 2).

L. heterophylla Meissn. [in DC., *Prodr.* 15 (1) 246, 1864] was described from specimens collected by Hooker in Sikkim (8000–9000 ft, K). The leaves of this species (see fig. 2, d, e) are entire or trilobed at the apex, more or less broadly elliptic to orbicular in outline, with apex acute or subacute and the base rounded or subcordate. Venation is pinnate but somewhat 3-veined a few millimetres above the base as the midrib and a pair of the lower lateral veins are more strongly developed than the other veins. The indumentum varies from densely brownish pubescent beneath in Sikkim to glabrous in Bhutan. Flowers are usually precocious and are borne in leafless umbels from purely floral buds, leaves and young shoots being produced by separate buds near the apex of the shoot. Thus specimens collected in the autumn, e.g. *Cooper* 2755 (E), show two types of bud: broadly ovoid flower buds in the lower parts of the shoot and ellipsoid vegetative buds nearer the apex.

Although *L. cercidifolia* is the other name reported from Bhutan it does not appear to be the oldest epithet for the species for as E. H. Wilson noted (1916, p. 85) following the account of *L. obtusiloba* Bl. "As here interpreted the distinction between this and *Lindera cercidifolia* Hemsley is obscure". We go further and state that no real distinction exists between the two.

L. obtusiloba Bl. was originally described from Japan (in *Mus. Bot. Lugd. Bat.* 1:325, 1851) and the species is also known from Korea and China. *L. cercidifolia* Hemsl. (in *J. Linn. Soc.* 26:387, 1891) was based on material collected by Henry in Patung district, Hupeh, China [Nos. 2503 (K), 3792 (K), 4919 (K)] of which the only flowering specimen (No. 3792) is a mixture—two of the three shoots being those of a *Corylopsis* species. Comparing this material and the specimens collected in Japan, Korea and from elsewhere in central and eastern China shows that, while they are similar to those of *L heterophylla* in some leaf characters, they differ consistently in several important respects. Although specimens of *L. obtusiloba* usually have some leaves that are 3-lobed at the apex (see fig. 2, a, b, c), in Henry's material there are only two leaves that are lobed and there may be other specimens like *Faurie* 873 from Che Ju-Do (Quelpart) Isl., Korea in which all the leaves are entire (this latter, however is an unusual specimen: see below). In general with these specimens it seems that the leaves produced later in the season are 3-lobed; possibly too the proportion of lobed to entire leaves produced may be governed by the state of maturity of the plant. Another generalisation seems possible from the available material: a higher proportion of specimens of *L. obtusiloba* have lobed leaves than those of *L. heterophylla.*

Leaf shape of *L. obtusiloba* is broadly ovate or orbicular with rounded or, more often, cordate bases. The venation is similar to that of *L. heterophylla* but the trinervation is basal. From their original gatherings, *L. cercidifolia* was described as glabrous, apart from hair at the vein axils beneath, and *L. obtusiloba* as being pubescent on the veins below: elsewhere in China similar specimens have been gathered and others in which the whole of the underside is pubescent. Flower production follows the same pattern as that of *L. heterophylla*, that is, there are separate floral and vegetative buds. In this respect *Faurie* 873 is seen as an aberrant specimen in which a few leaves are produced from the same bud as the flowers but with little or no production of a shoot as there is in *L. praetermissa* (see below).

It would appear from the collections examined, including those previously determined as *L. cercidifolia*, that *L. heterophylla* is confined to E Nepal,

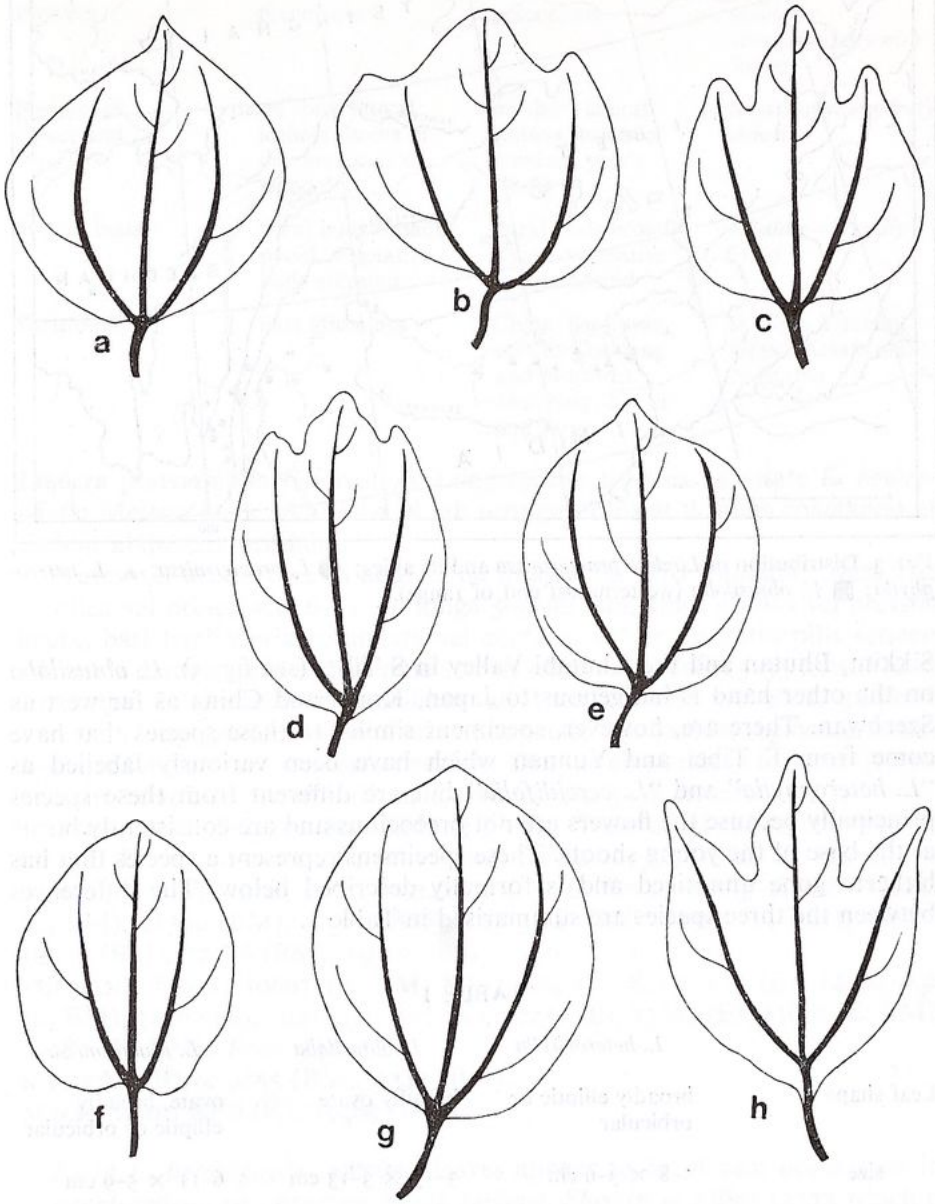

FIG. 2. Leaf outlines and venation of *Lindera praetermissa* and its allies: a, b and c, *L. obtusiloba*; d and e, *L. heterophylla*; f and g, *L. praetermissa*; h, *L. triloba*. All $\times \frac{1}{2}$.

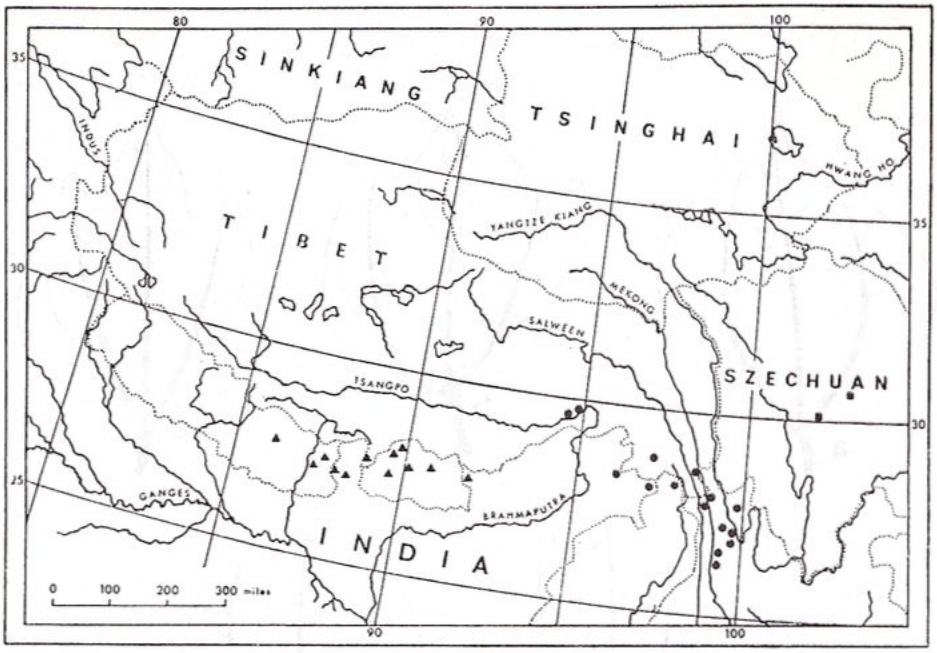

FIG. 3. Distribution of *Lindera praetermissa* and its allies; ● *L. praetermissa*; ▲ *L. heterophylla*; ■ *L. obtusiloba* (westernmost end of range).

Sikkim, Bhutan and the Chumbi Valley in S Tibet (see fig. 3). *L. obtusiloba* on the other hand is indigenous to Japan, Korea and China as far west as Szechwan. There are, however, specimens similar to these species that have come from E Tibet and Yunnan which have been variously labelled as "*L. heterophylla*" and "*L. cercidifolia*" but are different from these species principally because the flowers are not precocious and are consistently borne at the base of the young shoots. These specimens represent a species that has hitherto gone unnoticed and is formally described below. The differences between the three species are summarised in Table 1.

TABLE 1

	L. heterophylla	*L. obtusiloba*	*L. praetermissa*
Leaf shape	broadly elliptic or orbicular	broadly ovate	ovate, broadly elliptic or orbicular
size	5–8 × 3–6 cm	3–13 × 3–13 cm	6–11 × 5–9 cm
lobes	occasional	*frequent*	occasional
apex	obtuse or shortly acute	acute	obtuse or shortly acute
base	cuneate, rounded or weakly cordate	usually strongly cordate	rounded or cordate
venation	*strongest laterals arising suprabasally*	strongest laterals arising basally	strongest laterals arising basally

TABLE I (*continued*)

	L. heterophylla	*L. obtusiloba*	*L. praetermissa*
Flowers	precocious	precocious	*unfolding simultaneously with leaves*
Position of flower and fruit	on short lateral leafless shoots of previous year's wood	on short lateral leafless shoots of previous year's wood	*at base of young leafy shoots*
Winter buds	floral buds broadly ovoid, vegetative buds ellipsoid	floral buds broadly ovoid, vegetative buds ellipsoid	*all alike—broadly ovoid*
Distribution	East Himalaya	China, Szechwan east to Chekiang and North to Shantung; Korea and Japan	E Tibet, Yunnan, Upper Assam and N Burma

Lindera praetermissa Grierson & Long **species nova** ex affinitate *L. heterophylla* Meissn. et *L. obtusiloba* Bl. ab utroque foliis et floribus coaetaneis ex eisdem alabastris oriundis.

Frutex vel arbor 3–12 m alta. Folia integra vel raro trilobata, ovata late elliptica vel orbicularia 6–11 cm longa 5–9 cm lata, apice obtusa vel breviter acuta, basi triplinervia rotundata vel cordata, subter ab initio pilis sericeis adpressis demum pilis cinnamomeis venis obtecta; petioli 15–35 mm. Flores fragrantes in umbellis subsessilibus ad base ramulos novellos, pedicelli 1–1·5 cm longi pallide sericei. Perianthia petaloidea flavida, segmentis ovatis 3–4 mm longis 1–2·5 mm latis deciduis. Drupae ellipsoideae 6–8 mm longae 5–6 mm latae ad apicum pedicellos clavatos 2–2·5 cm ferentes.

EASTERN TIBET: Salwin—Kui Chiang divide, West of Si-chi-to, 28° 20′ N, 98° 30′ E, 10,000–11,000 ft, May 1922, *Forrest* 21594 (holo. E; iso. K), in flower (= 22878 in E, K, in fruit), 376 (E); *Ludlow, Sherriff & Elliot* 12296 (E, BM), 12306 (BM), 12322 (BM), 12373 (E, BM), 12382 (E, BM); *Ward* 10333 (BM), 12106 (BM), 19306 (BM).

YUNNAN: *Forrest* 10667 (E, BM, K), 11254 (E, K,) 11452 (E), 12408 *p.p.* (E, BM), 12962 (E), 16416 (E, BM, K), 22251 (E), 23503 (E), 23602 (E, BM), 29087 (E, BM); *Rock* 9483 (E).

N BURMA: *Ward* 9255 (BM), 9343 (BM).

ASSAM: *Ward* 8656 (K), 19469 (BM).

As in *L. heterophylla*, trilobed leaves appear to be of rare occurrence in *L. praetermissa*, one example being *Ludlow, Sherriff & Elliot* 12373 which is in young leaf.

A fourth Asiatic species of *Lindera* with trilobed leaves, *L. triloba* (Sieb. & Zucc.) Blume, must be mentioned here, for although it is confined to Japan some specimens of *L. obtusiloba* have been misidentified as this species. The leaf lobes of *L. triloba* are spreading (see fig. 2, h) not erect as in *L. obtusiloba* and its allies, and the trinervation of its leaves is suprabasal. It would appear however, that *L. triloba* belongs to a different section of the genus: its larger fruits, c. 1·5 cm, are dehiscent and because of this it was placed in a separate genus *Parabenzoin* by Nakai.

Litsea

Litsea nervosa (Kurz) Grierson & Long **comb. nov.**

Tetranthera chartacea [Wall. ex] Meissn. β ? *nervosa* Meissn. in DC., Prodr. 15 (1): 186 (1864) non *T. nervosa* Meissn. *ibidem*: 187.
Lindera nervosa (Meissn.) Kurz, Forest Fl. 2:308 (1877).
Litsea wallichii Hook. f., Fl. Brit. Ind. 5:160 (1886).

Kurz (*l.c.*) did not cite Meissner's variety as the basionym but Hooker equated them. Following the description of his variety Meissner cited "circa Amherst (Wall. n 1463 in hb. Birman.)" as type. This number, which appears on the type specimens in De Candolle's herbarium, is not a Wallich Catalogue number but does appear on the sheet of 7531/2 in Wallich's herbarium (K). The entry against 7531 in the Catalogue reads "Laurineae, Amherst 1827". Hooker (*l.c.*) did not of course cite 1463, but 2531B and 7531 *p.p.* These last two numbers appear to refer to the same collection as the catalogue entry against 2531B on p. 239 reads "ex Nees ab Esenbeck, Amherst 1827". Hence the epithets *nervosa* and *wallichii* are based on the same type.

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