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## Identity of *Archangelica roylei* LINDL. and its consequences for the nomenclature of some West Himalayan Umbelliferae

With 3 Figures

### Summary

The investigation of the type material of *Archangelica roylei* LINDL. clearly showed that this name is related to the plant, now known in taxonomic and floristic literature of the Himalayan flora as *Ligusticum elatum* EDGEW. The plant belongs neither to *Angelica* nor to *Ligusticum*, being closer to *Seseli mucronatum* (SCHRENK) PIMENOV & SDOBNINA. A new combination, *Seseli roylei* (LINDL.) PIMENOV & KLJUYKOV, has been proposed. Another combination, *S. alboalatum* (HAINES) PIMENOV & KLJUYKOV, has been proposed for a closely related species, previously treated also in *Ligusticum*. The correct name for the Western Himalayan species of *Angelica* sect. *Archangelica* is *A. oreadam* DIELS.

### Introduction

The Roylean Herbarium, housed now in LIV, was one of the earlier plant collections from the Western Himalaya (HARRISON 1978; STEWART 1979). Umbelliferae were studied by LINDLEY (1835), and, if one does not consider DECANDOLLE's (1830) descriptions based on the gatherings of N. Wallich, partly made in Kumaon, LINDLEY's names have a priority against many later descriptions (EDGEWORTH's, CLARKE's and so on). Unfortunately, due to incomplete investigation of type materials in LIV there is some misinterpretation of species, described by LINDLEY, especially as the diagnosis are sometimes very short.

### Zusammenfassung

Die Identität von *Archangelica roylei* LINDL. und die Konsequenzen für die Nomenklatur einiger Umbelliferae des Westhimalaya

Die Untersuchung des Typusmaterials von *Angelica roylei* LINDL. zeigte deutlich, dass dieser Name zu einer Pflanze gehört, die jetzt in der taxonomischen und floristischen Literatur der Himalaya-Flora als *Ligusticum elatum* EDGEW. bekannt ist. Die Pflanze gehört jedoch weder zu *Angelica* noch zu *Ligusticum*, sondern steht dem *Seseli mucronatum* (SCHRENK) PIMENOV & SDOBNINA näher. Daher wird die neue Kombination *Seseli roylei* (LINDL.) PIMENOV & KLJUYKOV vorgeschlagen. Eine weitere Neukombination, *S. alboalatum* (HAINES) PIMENOV & KLJUYKOV, wird für eine nahe verwandte Sippe vorgeschlagen, die früher zu *Ligusticum* gestellt wurde. Der korrekte Name für die West-Himalaya-Art aus *Angelica* sect. *Archangelica* ist *A. oreadam* DIELS.

### On the type material of *Archangelica roylei*

One of such species, described by LINDLEY with rather short diagnosis ("caule juniore pubescente, foliis bipinnatis, foliolis rhombeis pinnatifidis inciso-serratis, involucelli foliolis subulatis umbellulae aequalibus"), is *Archangelica roylei* LINDL. This description seems to be imperfect, not reflecting some characters, essential in the Umbelliferae systematics (for instance, nothing was said about fruits).

The plant must be collected by ROYLE's indigenous collectors, its type locality is "Urukta". This point is hardly found on modern geographical maps, at least available for us. But among illustrations in ROYLE'S books

(1833–1840) there is a profile (“section”) across southern slope of the Himalayas from Sidowra to the Shatool Pass and Kunawur, and Urukta is marked off in it. This is a rather low mountain (“hill”) not reaching upper forest border, and it is situated in present state of Himachal Pradesh, somewhere between Mt. Choordar (Chor) and Kinawur (Kunawur). This clarification is essential to limit the circle of plants, to which the name of *Archangelica roylei* might be corresponding.

This is essential because in the recent authoritative treatments of the Umbelliferae of S and SW Asia (RECHINGER 1987; MUKHERJEE & CONSTANCE 1993) the name *Angelica roylei* (LINDL.) P.K.MUKH. & CONSTANCE, based on *Archangelica roylei*, was accepted for the plant later described as *Archangelica officinalis* (MOENCH) HOFFM. var. *himalaica* C.B.CLARKE. This last species is truly closely related to the *A. archangelica* group, containing some vicariant taxa (cf. WEINERT 1973), distributed from Europe and Siberia via the Middle Asia and Xinjiang to the Western Himalayas. The area of the most southern species of the group (“*A. roylei*” by MUKHERJEE & CONSTANCE) is limited by the Eastern extremity of Afghanistan, Northern Pakistan and Kashmir (the indication for Sikkim is clearly wrong), and do not include Himachal Pradesh as a whole, and Siwalik Hills near Simla in particular. This species clearly differs from its nearest counterpart [*A. komarovii* (SCHISCHK.) V.N.TIKHOM. from Pamiro-Alai Mts. and Northern Afghanistan] in terminal leaf lobes, decurrent, oblong-lanceolate in outline with acute top in the Himalayan species against petiolulate, ovate or almost orbiculate in outline with obtuse top in *A. komarovii*. In its leaf dissection the Himalayan species is more similar to Tianshanian *A. tschimganica* (KOROVIN) V.N.TIKHOM.

The fruit investigation of “*A. roylei*” (Fig. 1) confirms its reference to *Angelica* sect. *Archangelica*. Its mericarps are slightly flattened dorsally, elliptic in outline, 6–7 mm long, 3.2–4 mm wide, calyx teeth obsolete. Stylopods depressed, lobed at margin, stylodia 0.6–0.7 long, recurved. Marginal ribs winged, dorsal keeled or almost filiform. Exocarp consisting of one layer of very small cells, interrupting near column (commissure narrow).

Mesocarp multilayered, of large parenchymatous cells with slightly lignified pitted walls. Secretory ducts cyclic, situated in the inner layer of mesocarp. Endocarp and spermoderma of small cells. Endosperm almost plane on the commissural side.

Checking of the type sheet of *Archangelica roylei*, kindly sent some years ago from LIV (Fig. 2) clearly showed that this plant has no relation to any *Angelica*, distributed in the Himalayas or in adjacent territories. It is undoubtedly identical with that what usually is named now as *Ligusticum elatum* (EDGEW.) C.B.CLARKE. Later we found in DD a herbarium note by C. NORMAN, showing that he had also been inclined to make a similar conclusion, but his point of view had never been published. If so, the name of *Archangelica roylei* is a name of priority for *Ligusticum elatum*. The only other name, which could compete with *A. roylei* in this context, is *Levisticum argutum* LINDL., described in the same publication by LINDLEY (1835). We did not see the type material of the latter from LIV, and it was not included in the list of Roylean types by HARRISON (1978). However, in LE there is one incomplete and imperfect sheet, being probably an isotype, and it seems to be another species. Even if *Levisticum argutum* would appear to be identical with *Ligusticum elatum*, as suggested EDGEWORTH (1846) and CLARKE (1879), it would not have any advantage over *Archangelica roylei*.

### The correct name of the Western Himalayan species of *Angelica* sect. *Archangelica*

The first consequence of the identity statement between *Archangelica roylei* and *Ligusticum elatum* afflies to the correct name of the Himalayan and East-Afghanian *Angelica* from the affinity of *A. archangelica*. Such correct name appears to be *Angelica oreadum* (DIELS) M.HIROE, based on the original description of *Archangelica oreadum* by DIELS (1939). The second series of homotypic names, based on *Archangelica officinalis* var. *himalaica*, are not of priority in the specific rank, although their basionym had been published earlier than *Archangelica oreadum* was. As a result a following corrected synonymy account for the Hima-

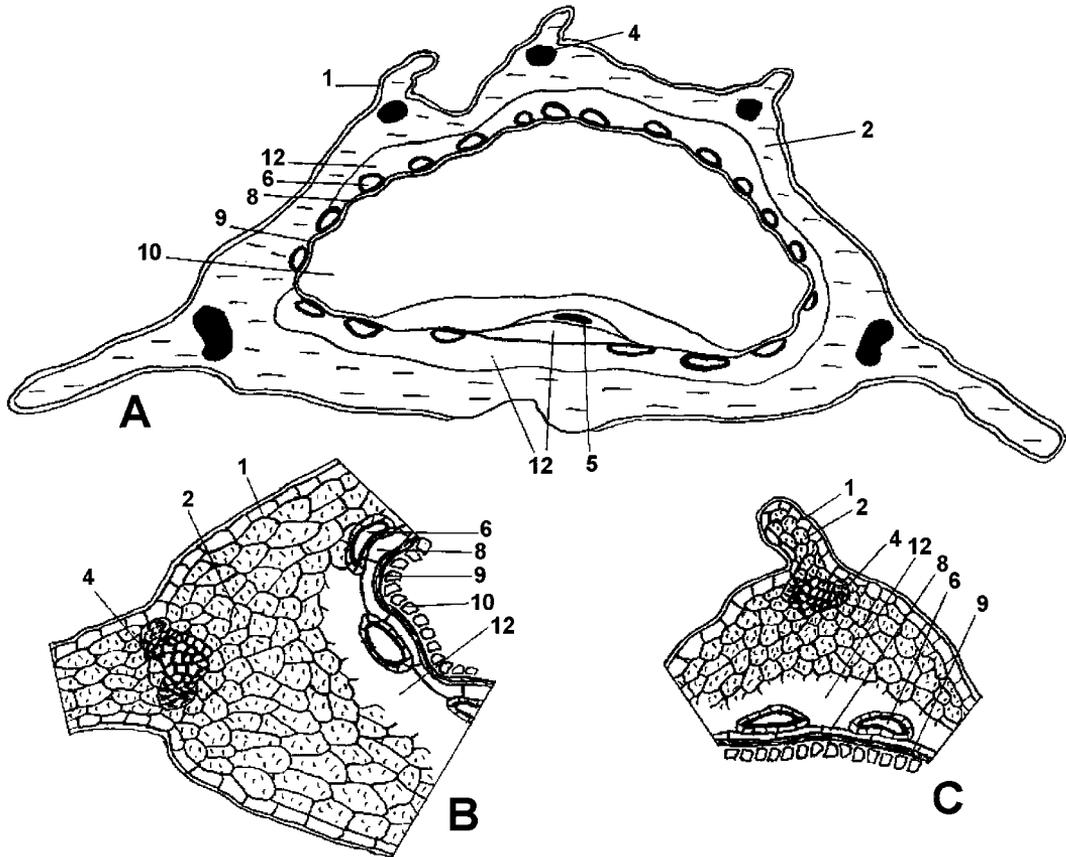


Fig. 1

*Angelica oreadum* (DIELS) M.HIROE

Cashmere, Dras. 10.–11.08.1927, R. R. STEWART, 7388, K

A — TS of mericarp; B — TS of lateral rib; C — TS of dorsal rib

1 — exocarp; 2 — mesocarp (parenchymous cells with slightly lignified pitted walls); 4 — rib vascular bundle; 5 — funicular vascular bundle; 6 — vallicular oil duct; 8 — endocarp; 9 — spermoderma; 10 — endosperm; 12 — cavity

layan *Angelica* from the section *Archangelica* can be compiled:

***Angelica oreadum* (DIELS) M.HIROE, Umbell.**  
**World: 1430 (1979) (“oreada”) ≡ *Archangelica oreadum* DIELS in Notizbl. Bot. Gart. Berlin 14: 353 (1939)**

Type: Pakistan, “Nanga-Parbat-Gebiet, Kalapani-Tal, zwischen Rattu und Kalapani an Bächen im Gebüsch und in der subalpinen Staudenflur, 2800–3200 m ü.M., 25.07.1937. C. TROLL, 7976” (holotype: B, destroyed?).

= *Archangelica officinalis* (MOENCH) HOFFM. var. *himalaica* C.B.CLARKE in HOOK. f. Fl. Brit. Ind. 2: 707 (1879), p.p. ≡ *Angelica archangelica* L. var. *himalaica* (C.B.CLARKE) KRISHNA & BADH-

WAR in J. Sci. Ind. Res. 11: 251 (1952); NASIR in Fl. West Pakist. 20: 126 (1972). ≡ *Angelica archangelica* L.f. *himalaica* (C. B. CLARKE) WEINERT in Feddes Repert. 84 (4): 310 (1973). ≡ *Angelica archangelica* L. subsp. *himalaica* (C.B.CLARKE) G. SINGH in Forest Fl. Srinagar: 183 (1976); G. SINGH & G.M. OZA in Bull. Bot. Surv. India 16 (14): 168 (1977, “1974”).

Type: India “Kashmir, 8000–13000 ft. C. B. CLARKE & J. E. T. AITCHISON” (syntype: K!); “Jogi, alt. 11000 ft. T. THOMSON”, (syntype: K!).

– *Archangelica officinalis* auct. non HOFFM.: KAUL in J. Bombay Nat. Hist. Soc. 72 (3): 741 (1975).

– *Angelica roylei* auct. non LINDL.: RECH.f. in Fl. Iran 162: 521, pl. 481 (1987); MUKH. &



Fig. 2  
Type specimen of *Archangelica roylei* LINDL. (LIV)

CONSTANCE in Edinb. J. Bot. 48 (1): 44 (1991);  
ejusd. Umbell. (Apiaceae) India: 213 (1993).

Chromosome number:  $n = 11$ ;  $2n = 22$  (sub  
*A. archangelica* var. *himalaica*) (AHMAD & KOUL  
1980; JEE et al. 1985; HAMAL et al. 1986).

Distribution: India (W Himalayas: Jammu  
and Kashmir); Pakistan; Afghanistan.

**The generic position and correct specific  
epithet of *Ligusticum elatum* (EDGEW.)  
C.B.CLARKE**

The second consequence concerns the so-called  
*Ligusticum elatum* (EDGEW.) C.B.CLARKE,  
based on *Cortia elata* EDGEW. (1846). For this  
species the name of *Archangelica roylei* has  
priority. We, however, are not in a hurry to  
propose a combination of "*Ligusticum roylei*",  
although it is not occupied. The issue is more  
complicated on the generic level, due to artificial  
nature of *Ligusticum* s.l. in its the most  
widely adopted modern circumscription, used,  
for instance, in the authoritative treatments of  
local Umbelliferae (NASIR 1972; RECHINGER

1987; MUKHERJEE & CONSTANCE 1993). As  
we noted previously (PIMENOV & LAVROVA  
1989; PIMENOV 1995), the type species of  
*Ligusticum* L., *L. scoticum* L., differs consider-  
able from almost all remaining species, attrib-  
uted to the genus. For instance, it differs from  
the Himalayan species including *L. elatum* and  
its closest relatives. On the other hand, *L. elatum*  
is similar in some character with *L. thomsonii*,  
described from Kashmir, and later shown to  
be identical with *Seseli mucronatum*  
(SCHRENK) PIMENOV & SDOBNINA (PIMENOV  
1995). The latter has a rather huge synonymy  
(PIMENOV & SDOBNINA 1973). Fruit structure  
in *S. mucronatum* and *L. elatum* (Fig. 3A) is  
rather similar. Both have mericarps slightly  
compressed dorsally, exocarp of small lepto-  
dermatous cells, interrupting near the ends of  
marginal ribs (i.e. commissure is broad); margi-  
nal ribs broader than dorsal; mesocarp cells  
in ribs with slightly lignified pitted walls (2)–  
3–4 vittae per vallecule and 6–8 on commis-  
sural side, endosperm plane on the commissu-  
ral surface. Although the fruits of the both  
species seem to be glabrous, they are covered  
by very rare short hairs, pubescence being the  
character very peculiar for *Seseli* [for instance,  
the closest relative of *S. mucronatum*, mainly  
Siberian *S. condensatum* (L.) RCHB.f., has the  
fruits clearly pubescent].

Our field observation near Simla in Hi-  
machal Pradesh, i.e., in the region from which  
both *Cortia elata* and *Archangelica roylei* had  
been described showed that the species has a  
great similarity in leaf, stem, underground part  
and inflorescence structure with *S. mucro-  
natum* (*L. thomsonii*) distributed northernmore.  
Its species independence is, however, evident.  
Thus, *L. elatum* belongs to the same group of  
boreal (in general) and mesophilic species of  
*Seseli*, as *S. mucronatum*, *S. condensatum* and  
*S. nemorosum* (KOROVIN) PIMENOV belong  
(*Seseli* sect. *Condensata*).

*Ligusticum marginatum* C.B.CLARKE is  
very close to *L. elatum*, as was noted by some  
specialists earlier (LEUTE 1970; NASIR 1972;  
RECHINGER 1987; MUKHERJEE & CONSTANCE  
1993). According to these publications, the  
differences of two species are limited mainly to  
pubescence of stems and leaves and/or involu-  
cre development, and seem to be in limits of  
the infraspecific variability, whereas both were

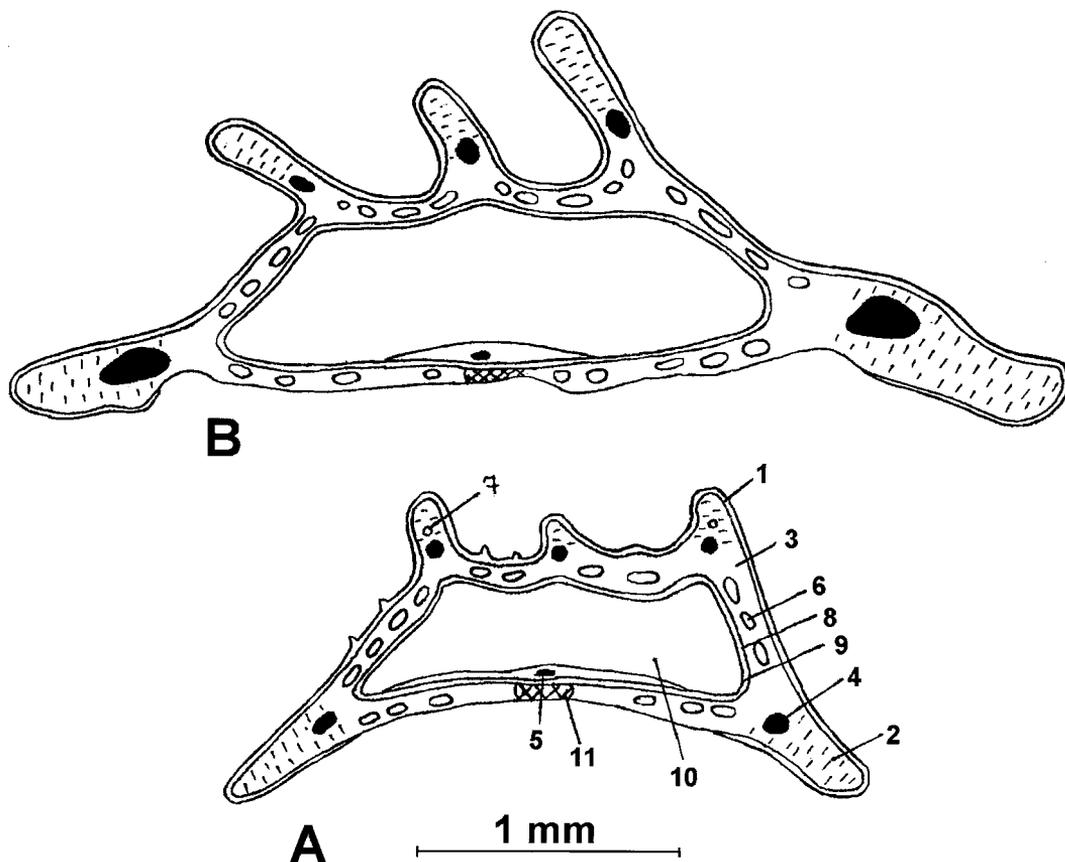


Fig. 3

TS of mericarps

A — *Ligusticum elatum* (EDGEW.) C.B. CLARKE [= *Seseli roylei* (LINDL.) PIMENOV & KLJUYKOV] (India, Himachal Pradesh, Shimla distr., Matiana, 12.09.2000, M. G. PIMENOV & E. V. KLJUYKOV, 188 MW);  
 B — *Ligusticum alboalatum* HAINES = *Seseli alboalatum* (HAINES) PIMENOV & KLJUYKOV (Bihar, Sarguja, 10.05.1940, H. F. MOONEY, 1307 DD)

1 – exocarp; 2 – mesocarp (parenchymous cells with slightly lignified pitted walls); 3 – mesocarp; 4 – rib vascular bundle; 5 – funicular vascular bundle; 6 – vallecular oil duct; 7 – rib oil duct; 8 – endocarp; 9 – spermoderma; 10 – endosperm; 11 – sclerenchyma

described from the same region of so called Siwalik and Simla Hills. Our own collections from the region, classical for both species, showed considerable variability in hair development and number of bracts both within and among populations. Leaf lamina dissection varies also in large limits from almost pinnatifid to bipinnatifid and more. COLLETT (1921), the author of local Flora Simlensis, included *L. marginatum* into synonymy of *L. elatum*. We also regard the name of *L. marginatum* as a further later synonym of *L. elatum*, for which

the correct generic position is in *Seseli* sect. *Condensata*, and the prioritic name is *Angelica roylei*.

***Seseli roylei* (LINDL.) PIMENOV & KLJUYKOV, comb. nova**

≡ *Archangelica roylei* LINDL. in ROYLE, III. Bot. Himal.: 232 (1835). ≡ *Angelica roylei* (LINDL.) P.K.MUKH. & CONSTANCE in Edinb. J. Bot. 48 (1): 44 (1991), quoad nomen; ejusd. Umbell. (Apiaceae) India: 213 (1993), quoad nomen.

Type: India “[Himachal Pradesh] Urukta. J. F. ROYLE’s collectors” (holotype: LIV!).

= *Ligusticum elatum* (EDGEW.) C. B. CLARKE in HOOK.f. Fl. Brit. Ind. 2: 698 (1879); COLLETT in Flora Simlensis, 2<sup>nd</sup> ed.: 212 (1921); M. HIROE Umbell. Asia 1: 107 (1958); KITAM, Fl. Afghan.: 289 (1960); LEUTE, Ann. naturhist. Mus. Wien 74: 487, pl. 1, fig. 3 (1970); NASIR, in Fl. West Pakist. 20: 123, fig. 36 (1972); M. HIROE, Umbell. World: 1068 (1979); RECH. in Fl. Iran. 162: 358, pl. 289 (1987); MUKH. & CONSTANCE, Umbell. (Apiaceae) India: 179 (1993); ASWAL & MEHROTRA, Fl. Lahaul-Spiti: 287 (1994). ≡ *Cortia elata* EDGEW. in Trans. Linn. Soc. London 20 (1): 55 (1846).

Type: India “Himal., in apricis graminosis alt. ped. 7 000–9 000, MAHASEO & C. M. P. EDGEWORTH, 1884” (syntype, K!).

= *Ligusticum marginatum* C.B.CLARKE in HOOK.f., Fl. Brit. Ind. 2: 698 (1879); LEUTE, in Ann. naturhist. Mus. Wien 74: 488, pl. 13, fig. 4 (1970); NASIR, in Fl. West Pakist. 20: 123 (1972); RECH., in Fl. Iran. 162: 359, pl. 290 (1987); MUKH. & CONSTANCE, Umbell. (Apiaceae) India: 171 (1993).

Type: India „Himalaya boreo-occidentalis, 7 000–8 000 ft., Simla and Naini Tal. T. Thomson”, (syntype, K!).

Chromosome number:  $n = 11$ ;  $2n = 22$ , 22+1-1B (sub *L. elatum*) (SINHA & SINHA 1977; AHMED & KOUL 1980; HAMAL et al. 1986).

Distribution: India (W Himalayas: Jammu and Kashmir, Himachal Pradesh, Uttar Pradesh); Pakistan; Afghanistan. The indications for Thailand (HIROE 1967) are based probably on a misidentification. Recently this species has been also shown to be distributed in Chinese Xizang A. R. (PU 1991; PU et al. 1992). The listed localities (Main ling, Bo wo) are situated in Eastern Tibet, very far from the area of *S. roylei*, and it seems to us that another species, probably *Ligusticopsis brachyloba*, might be distributed in these places, being wrongly determined as *Ligusticum elatum*.

### On *Ligusticum alboalatum* HAINES

There is a further species, closely related to previous one; this is little-known and rare *Ligusticum alboalatum* HAINES, distributed only in the State of Bihar (Northern India). Its fruits (Fig. 3B), studied on the MOONEY’s collection from Sarguja, Bihar (DD) are slightly bigger and more compressed, as fruits of “*Ligusticum elatum*”, their marginal ribs being broader and

whitish, but in other characters both species are very similar.

### *Seseli alboalatum* (HAINES) PIMENOV & KLJUYKOV, comb. nova

≡ *Ligusticum alboalatum* HAINES, in J. Asiat. Soc. Bengal 2 (15): 314 (1920); MUKH. & CONSTANCE, Umbell. (Apiaceae) India: 171 (1993).

Type: India “Mountains of Chota Nagpur, elev. 2500–3000 ft., near streams. H. H. HAINES”.

Distribution: India (N Bihar).

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