

FLORA OF NEPAL NOTULAE V: NEW SPECIES AND COMBINATIONS IN HIMALAYAN PLANTAGINACEAE AND SCROPHULARIACEAE

P. A. Kosachev ¹ & C. A. Pendry ²

Two new species in the genus *Lagotis* Gaertn. (Plantaginaceae) are described from Nepal. Specimens of *Lagotis annapurnensis* and *L. geniculiflora* were formerly identified as belonging to the polymorphic species *L. kunawurensis*. They are distinguished from this species by their geniculate or bent corollas. *Lagotis annapurnensis* and *L. geniculiflora* are distinguished from each other by the size and shape of their bracts. A key to the species in Nepal is provided. Two combinations are made in *Nanorrhinum* (Plantaginaceae), and two combinations in *Scrophularia* (Scrophulariaceae), to reflect changes in the taxonomy of *Kickxia* Blume and *Oreosolen* Hook.f.

Keywords. *Lagotis*, *Nanorrhinum*, *Scrophularia*, taxonomy.

Received 17 January 2025 Accepted 15 April 2026 Published 17 June 2026

Introduction

Accounts of the Plantaginaceae and Scrophulariaceae for the *Flora of Nepal* are currently in preparation, and this work has highlighted some taxonomic issues which need to be resolved ahead of their publication. *Lagotis* Gaertn. is a genus of about 30 species of perennial herbaceous plants in the Plantaginaceae Juss. It has a circumboreal distribution and is also found in the highlands of Asia from Japan to Asia Minor (Vikulova & Shishkin, 1955; Hedge, 1978; Hong *et al.*, 1998). The centre of diversity is in the Kunlun Mountains, the Tibetan Plateau and the Himalayas, where 80% of all species occur, but until now only three species have been reported from Nepal: *Lagotis clarkei* Hook.f., *L. kunawurensis* (Royle ex Benth.) Rupr. and *L. nepalensis* T.Yamaz. (Bentham, 1835; Hooker, 1885; Yamazaki, 1971; Hara *et al.*, 1982; Press *et al.*, 2000). *Lagotis crassifolia* Prain has also been reported for Nepal (Rajbhandari *et al.*, 2022), but this is based on a single specimen identified here as *L. kunawurensis*.

Mill (2001) revised *Lagotis* for the *Flora of Bhutan* and subsequently annotated several Nepalese specimens of the polymorphic species *L. kunawurensis* with designations that were never formally published as names. Subsequent investigations for the forthcoming Plantaginaceae account in the *Flora of Nepal*, which included examination of specimens of *Lagotis* at E, K, KATH and TI (herbarium codes follow Index Herbariorum, [updated continuously](#)), have confirmed that these specimens do indeed represent two previously

¹ Altai State University, 61 Lenina Prospekt, Barnaul 656049, Russian Federation.

² Royal Botanic Garden Edinburgh, 20A Inverleith Row, Edinburgh EH3 5LR, Scotland, UK. Author for correspondence. E-mail: c.pendry@rbge.org.uk.

unpublished species, one of which is endemic to Nepal. A key to the species in Nepal is provided.

Two new combinations are made in *Nanorrhinum* (Plantaginaceae), and two in *Scrophularia* (Scrophulariaceae).

Taxonomic treatment

Lagotis annapurnensis R.R.Mill ex. Kosachev, sp. nov.

Lagotis annapurnensis is close to *L. kunawurensis* and the new species described below. It clearly differs from *Lagotis kunawurensis* by its curved or bent corolla and shorter lobes of the upper lip, and from *L. kunawurensis* and the new species described below in its bracts, which are ovate-elliptical, subentire with several small teeth and obtuse at the tip. It differs from the new species described below in its corolla, which has recurved rather than straight lobes, and in the smaller teeth on its calyx. – Type: Nepal. Gandaki Pradesh, Manang District: Thorong La, 4720 m, 25 vii 1983, McBeath 1477 (holotype [E00662919](#)).

Figure F–J.

Erect, ± glabrous, rosulate, perennial herb, 7–15 cm tall. *Petioles* 2–2.5(–4) cm long, distinct; lamina elliptic to ovate or oblong, 1–5.5 × 1.0–2(–3) cm, base rounded to broadly cuneate, apex obtuse, margin finely crenate. *Stems* usually 5–7 cm long, with 2 sessile or short-stemmed leaves, lamina ovate or elliptic, shallow-walled. *Inflorescence* a dense, cylindrical spike, 2–4 × 1.5–2 cm. *Bracts* ovate-elliptical, 4.5–7.5 × 2–5 mm, subentire, with several small teeth towards apex. *Calyx* 5–7 × 0.7–4.2 mm, divided in the upper third into 2 acute, shortly pubescent teeth, the teeth 0.5 mm long. *Corolla* white or pink to pale purple blue; tube bent at an angle of 90° or bent; the upper lip 3–4 × 2–2.5 mm, obtuse; the lower lip with 2 linear recurved lobes, each 2.5–3.5 × 1–1.5 mm. *Ovary* c.1 mm, style 5–5.5 mm. *Fruit* not seen.

Distribution. Endemic to Nepal.

Habitat and ecology. Open, wet, stony slopes, in scree and alpine turf, 4200–5800 m a.s.l.

Etymology. The species is named after the collection locality of the type specimen.

Proposed IUCN conservation category. The range of *Lagotis annapurnensis* is highly fragmented by mountain ranges, and its habitat is under threat of contraction because of climate change and is likely to suffer degradation from overgrazing and uncontrolled collection of medicinal plants. It is known from fewer than five locations, with an Extent of Occupancy of 300 km², and here it is assessed as EN B1ab(i).

Notes. R. Mill annotated *Polunin, Sykes & Williams* 1130 (BM) as the holotype of the designation *Lagotis annapurnensis*, with the two duplicates in E as isotypes, but did not publish the name. However, each of these three specimens is a mixed collection from two localities separated by 3000 ft [sic] of elevation. Under Articles 8.2 and 9.14 of the

International Code of Nomenclature (Turland et al., 2018), for mixed collections the part that most closely resembles the original description or diagnosis should be identified as the type. No diagnosis or description was made in this case, so *McBeath* 1477, which was also annotated by Mill as *Lagotis annapurnensis* (the name formally published here), was chosen as the type of this name. Furthermore, the localities from which *Polunin, Sykes & Williams* 1130 was collected are in Dolpa, and distant from the Annapurna region, while *McBeath* 1477 is from the northern side of the Annapurna Range. *Lagotis annapurnensis* belongs to sect. *Lagotis* H.P.Yang.

Additional specimens examined. NEPAL. Koshi Pradesh: Dolpa District: Rohagaon, Suli Gad, 4270 m, 26 vi 1952, *Polunin, Sykes & Williams* 2306 (E00662917, KATH035978); Barbung Khola below Chharkabhotgaon and Mohala Bhanjyang, 4890 and 5790 m, 14 vi 1952, *Polunin, Sykes & Williams* 1130 (BM000885937, E00662916 and E00662918).

***Lagotis geniculiflora* R.R.Mill ex Kosachev, sp. nov.**

Lagotis geniculiflora is close to *L. kunawurensis* but differs from it by its geniculate, white corolla with shorter lobes on its upper lip. It is also similar to *Lagotis annapurnensis* but differs from it in its larger ovate-oblong and dentate bracts, straight rather than recurved lobes of the lower lip, and larger teeth on the calyx. – Type: Nepal, Karnali Pradesh, Dolpa District, Balangra pass, 4270 m, 27 vii 1952, *Polunin, Sykes & Williams* 2600 (holotype BM000885935, isotype TI). **Figure A–E.**

Erect, ± glabrous, rosulate, perennial herb, 9–30 cm tall. *Rhizomes* 3–5 mm in diameter, lateral roots fascicled. *Petioles* 2–11 cm long, distinct; lamina elliptic to ovate or oblong, 3–7(–8) × 1.5–4(–5) cm, base shortly attenuate to cuneate, apex obtuse, margin coarsely crenate. *Scapes* 1 or 2, rarely 3, 10–20(–30) cm long, with 2–4 sessile or shortly petiolate leaves, the lamina ovate or elliptic, 1.5–1.8(–2.6) × 1–1.5(–2.2) cm, shallowly crenate to coarsely dentate or entire. *Inflorescence* a dense, cylindrical spike, (3–)5–8 × 1.5–2 cm long. *Bracts* ovate-oblong, 6–13 × 2.5–6 mm, dentate, eglandular. *Calyx* 4–6.5 × 1.5–2 mm, open on the lower side, divided in the upper third into 2 acute, shortly pubescent teeth, the teeth approximately 1 mm long. *Corolla* white, 13–14 mm long, tube 9–10 mm, geniculate; the upper lip entire, 2.5–3 × 1.8–2.5 mm, obtuse; the lower lip with 2 straight, linear lobes, 2.5–3.0 × 1 mm. *Ovary* 1.5–2 mm, style 6–8 mm, stigma bifid. *Fruit* a 2-seeded, slightly laterally compressed, beaked drupe, 5–6 × 3.5–4 mm.

Distribution. Nepal, Pakistan.

Habitat and ecology. Open, wet, stony slopes, in scree and alpine turf, 3300–5100 m a.s.l.

Etymology. The specific epithet is derived from the geniculate corolla tube.

Proposed IUCN conservation category. The range of *Lagotis geniculiflora* is highly fragmented by mountain ranges, and its habitat is under threat of contraction because of climate

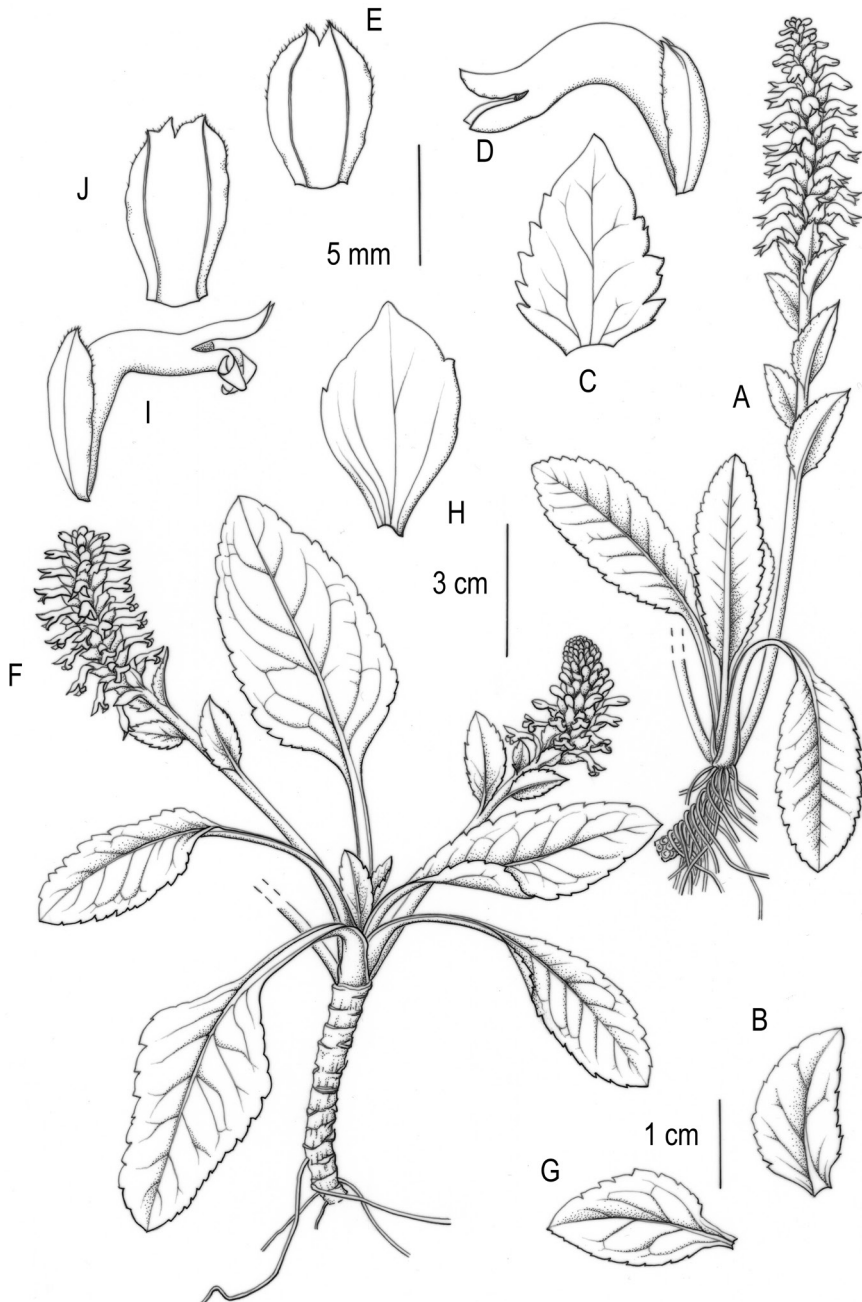


Figure. *Lagotis geniculiflora* R.R.Mill ex Kosachev, sp. nov.: A, habit; B, scape leaf; C, bract; D, flower; E, calyx. *Lagotis annapurnensis* R.R.Mill ex Kosachev, sp. nov.: F, habit; G, scape leaf; H, bract; I, flower; J, calyx. Scale bars: A and F, 3 cm; B and G, 1 cm; C–E and H–J, 5 mm. *Lagotis geniculiflora* drawn from Dhwoj 236 (E), and *L. annapurnensis* drawn from McBeath 1477 (E), by Claire Banks.

change and is likely to suffer degradation from overgrazing and uncontrolled collection of medicinal plants. It is known from fewer than 10 locations, with an Extent of Occupancy of 14,000 km², and here it is assessed as VU B1ab(i).

Notes. Despite the broad distribution of *Lagotis geniculiflora* across the Nepalese Himalaya, we were unable to find material of this species from neighbouring regions in BM, E and K, except for two locations in Pakistan. *Lagotis geniculiflora* belongs to sect. *Lagotis* H.P.Yang (= sect. *Caulescentes* Maxim. *nomen nudum*. Typus: *L. glauca* Gaertn.) (Lu, 1992).

Additional specimens examined. NEPAL. **Koshi Pradesh:** Solukhumbu District: Lumteng to Tshotang, 4430 m, 10 vii 1996, *Tsuchiya* 42316 (KATH017081). **Bagmati Pradesh:** Ramechhap District: Bigphera Lho Glacier to Thare Og, 4150–5080 m, 28 vii 1985, *Ohba* et al. 8580539 (E00662908, KATH, TI); Dubikharka to Baula Pokhari, 3720–4000 m, 9 vii 1985, *Ohba* et al. 8580204 (E00662911, TI); Dubikharka to Baula Pokhari, 3720–4000 m, 9 vii 1985, *Ohba* et al. 60176 (KATH035984). **Rasuwa District:** Thulo Bhera Kharka, 4390 m, 29 vii 1994, *Miyamoto* et al. 9440045 (E00074441, TI); Thulo Bhera Kharka, 4390 m, 29 vii 1994, *Miyamoto* et al. 9410100 (E00074442, TI); Jaisul Kunda, 4300 m, 30 vii 1994, *Rajbhandari* 17266 (KATH016193); Mul Kharka to Chilime Khola, 4000 m, 4 vii 1970, *Kanai & Shakya* 672277 (KATH035990). **Sindhupalchok District:** Ghopte to Gyaze, 4000 m, 19 vi 1986, *Bhattarai* 86/430 (KATH035986, KATH035987). **Gandaki Pradesh:** Gorkha District: Sama Gaon, 4260 m, 5 viii 2008, *Ikeda* et al. 20815127 (E00780303); Samdo, 4220 m, 9 viii 2008, *Ikeda* et al. 20817113 (E00656270). **Lamjung District:** Lamjung Himal, 4570 m, 11 vii 1954, *Stainton, Sykes & Williams* 6297 (TI10009807). **Mustang District:** Pongio Kharka, 4570 m, 11 viii 2002, *Miyamoto* et al. 20210058 (E00241692, TI). **Karnali Pradesh:** Mugu District: Nangja La, 4850 m, 1 viii 1983, *Tabata* et al. 17841 (KATH035977); Between Tangkhaya and Teungoya, beside Mugu Karnali river, 3900 m, 31 vii 1983, *Tabata* et al. 17726 (KATH035979). **Lumbini Pradesh:** Eastern Rukum District: NE of Chalike Pahar, 4420 m, 14 vi 1954, *Stainton, Sykes & Williams* 3114 (KATH035981). **Province Unknown:** Gurkha Nesum, 22 vii 1937, *Bailey s.n.* (E00662912, E00662913); 1927, *Wigram* 33 (E00662915); 1929, *Dhwoj* 30 (E00662914); 1928, *Dhwoj* 113 (E00662909); Old Duab Kund, 4570–5490 m, 1930, *Dhwoj* 236 (E00662910); 3048–4572 m, 20 v 1932, *Sharma s.n.* (Natural History Museum, Tribhuvan University).

PAKISTAN. **Gilgit-Baltistan:** Shingo valley, 3350 m, 6 vii 1892, *Duthie* 11862 (BM, E01072796); Chota Deosai, *Stewart* 19915 (K)

Key to the species of *Lagotis* in Nepal

- 1a. Inflorescence globose. Calyx of 2 sepals _____ *L. nepalensis*
- 1b. Inflorescence an elongate spike. Calyx spathaceous, split on the lower side _____ 2
- 2a. Calyx longer than corolla and up to twice the length of the bracts in the middle of the inflorescence. Lower lip of corolla 3-lobed _____ *L. clarkei*
- 2b. Calyx shorter than the corolla and bract. Lower lip of corolla 2-lobed _____ 3
- 3a. Corolla blue or pale blue-violet, tube straight, upper lip 4–6 mm long __ *L. kunawurensis*
- 3b. Corolla white or pink to pale purple-blue, tube geniculate-curved or bent, upper lip 2.5–4 mm long _____ 4

-
- 4a. Bracts ovate-oblong, 6–13 × 2.5–6 mm, dentate. Corolla white, lobes of the lower lip straight. Calyx teeth 1 mm _____ *L. geniculiflora*
- 4b. Bracts ovate-elliptical, 4.5–7.5 × 2–5 mm, subentire, with several small teeth towards apex. Corolla white or pink to pale purple blue, lobes of the lower lip recurved. Calyx teeth 0.5 mm _____ *L. annapurnensis*

New combinations in *Nanorrhinum* Betsche (Plantaginaceae)

Yousefi *et al.* (2016) conducted a phylogenetic analysis of 22 species of *Kickxia* Blume *s.l.* from the *Flora Iranica* region and concluded that the species of *Kickxia* with valvate capsules should be recognised as a distinct genus, *Nanorrhinum* Betsche. They made six new combinations but treated only the species found within their study region. Mill (2001) included two species of *Kickxia* (in Scrophulariaceae) endemic to Bhutan, namely *K. membranacea* Sutton and *K. papillosa* R.R.Mill, and since they have valvate capsules they should also be referred to *Nanorrhinum*. The combinations are made here.

Nanorrhinum membranaceum (Sutton) Kosachev, *comb. nov.* – *Kickxia membranacea* Sutton, in *Rev. Antirrh.*: 191 (1988).

Nanorrhinum papillosum (R.R.Mill) Kosachev, *comb. nov.* – *Kickxia papillosa* R.R.Mill, in *Edinburgh J. Bot.* 57: 419 (2000).

New combinations in *Scrophularia* L. (Scrophulariaceae)

Chen *et al.* (2017) included the genus *Oreosolen* Hook.f. in *Scrophularia*, based on a phylogenetic analysis of Chinese taxa in these genera. The relationship between *Oreosolen* and *Scrophularia* was inferred based on one nuclear (ITS) and three plastid (*trnL-F*, *psbA-trnH* and *trnQ-rps16*) DNA regions using maximum-parsimony, maximum-likelihood, and Bayesian inference methods. The results revealed that *Oreosolen* was nested within *Scrophularia*, and thus its generic status was not supported. Its type species, *Oreosolen wattii* Hook.f., was then transferred to *Scrophularia*, and the new combination *Scrophularia wattii* (Hook.f.) P.Li was made. However, no new combinations were proposed for the other four species from the genus *Oreosolen*. Two of these species, *Oreosolen unguiculatus* Hemsl. and *Oreosolen williamsii* T.Yamaz., occur in Nepal, so new combinations need to be made ahead of publication of the account of *Scrophularia* in the *Flora of Nepal*. For completeness, the remaining combinations are also made here.

Scrophularia alaicus (B.Fedtsch.) Kosachev, *comb. nov.* – *Nathaliella alaica* B.Fedtsch. in *Bot. Zhurn. S.S.S.R.* 17: 327 (1932).

Oreosolen alaicus (B.Fedtsch.) Pavlov, in *Vestn. Akad. Nauk Kazakhsk. S.S.R.* 10(5): 113 (1953).

Scrophularia schaeferi (Melch.) Kosachev, **comb. nov.** – *Oreosolen schaeferi* Melch., in Ber. Deutsch. Bot. Ges. 63: 118 (1950).

Scrophularia unguiculata (Hemsl.) Kosachev, **comb. nov.** – *Oreosolen unguiculatus* Hemsl., in Hooker's Icon. Pl. 25: t. 2467 (1896).

Scrophularia williamsii (T.Yamaz.) Kosachev, **comb. nov.** – *Oreosolen williamsii* T.Yamaz., in J. Jap. Bot. 46: 245 (1971).

Acknowledgements

We thank the curators of the BM, E, K and KATH herbaria for providing access to the materials studied, and the two reviewers for their improvements to the manuscript. We particularly thank Claire Banks for her excellent illustration.

ORCID iDs

P. A. Kosachev  <https://orcid.org/0000-0002-4087-6336>

C. A. Pendry  <https://orcid.org/0000-0002-7619-824X>

References

- Bentham G. 1835. Scrophularinaea Indicae: a synopsis of the East Indian Scrophularineae contained in the collections presented by the East India Company to the Linnean Society of London, and in those of Mr. Royle and others; with some general observations on the affinities and sub-divisions of the order. London: Ridgeway.
- Chen C, Cai MQ, Xu B, Jin XJ, Wang RH, Li P, Zhao YP, Fu CX. 2017. Systematic position of *Oreosolen* (tribe Scrophularieae, Scrophulariaceae) based on nuclear and plastid sequences. Journal of Systematics and Evolution. 55(5): 446–452. <https://doi.org/10.1111/jse.12249>
- Hara H, Chater OA, Williams LHJ. 1982. An Enumeration of the Flowering Plants of Nepal. Vol. 3. London: Trustees of the British Museum (Natural History).
- Hedge IC. 1978. *Lagotis*. In: Davis PH, editor. Flora of Turkey and the East Aegean Islands, vol. 6. Edinburgh: University Press; pp. 753–754.
- Hong DY, Yang H, Jin C, Fischer MA, Holmgren NH, Mill RR. 1998. *Lagotis*. In: Wu Z, Raven PH, Hong DY, editors. Flora of China, vol. 18. Beijing: Science Press, and St Louis: Missouri Botanical Garden Press; pp. 80–84.
- Hooker JD. 1885. The Flora of British India. Vol. 4. Ashford: Reeve & Co.
- Index Herbariorum. Updated continuously. Index Herbariorum: A Global Directory of Public Herbaria and Associated Staff. New York Botanical Garden's Virtual Herbarium. <http://sweetgum.nybg.org/science/ih/> [Accessed 23 May 2023.]
- Lu X. 1992. A taxonomic study of the genus *Lagotis* Gaertn. (Scrophulariaceae) in the Qinghai-Xizang plateau. Acta Biologica Plateau Sinica. 11: 187–203.

-
- Mill RR. 2001. Scrophulariaceae. In: Grierson AJC, Long DG, editors. Flora of Bhutan, vol. 2, part 3. Edinburgh: Royal Botanic Garden Edinburgh; pp. 1082–11236.
- Press JR, Shrestha KK, Sutton DA. 2000. Annotated Checklist of the Flowering Plants of Nepal. London: The Natural History Museum.
- Rajbhandari KR, Rai SK, Chettri R. 2022. A Handbook of the Flowering Plants of Nepal, vol. 4. Kathmandu: Department of Plant Resources; pp. 186–187.
- Turland NJ, Wiersema JH, Barrie FR, Greuter W, Hawksworth DL, Herendeen PS, Knapp S, Kusber WH, Li DZ, Marhold K, May TW, McNeill J, Monro AM, Prado J, Price MJ, Smith GF, editors. 2018. International Code of Nomenclature for algae, fungi, and plants (Shenzhen Code) Adopted by the Nineteenth International Botanical Congress Shenzhen, China, July 2017. Regnum Vegetabile 159. Glashütten: Koeltz Botanical Books. <https://doi.org/10.12705/Code.2018>
- Vikulova NV, Shishkin BK. 1955. *Lagotis*. In: Schischkin BK, Bobrov EG, editors. Flora of the USSR. Volume 22, Solanaceae and Scrophulariaceae. Moscow–Leningrad: Publishing House of the USSR Academy of Sciences; pp. 500–511.
- Yamazaki T. 1971. New and noteworthy plants of Scrophulariaceae in Himalaya. Journal of Japanese Botany. 46(8): 242–244.
- Yousefi N, Zarre S, Heubl G. 2016. Molecular phylogeny of the mainly Mediterranean genera *Chaenorhinum*, *Kickxia* and *Nanorrhinum* (Plantaginaceae, tribe Antirrhineae), with focus on taxa in the Flora Iranica region. Nordic Journal of Botany. 34(4): 455–463.