

Additions to Legume (Papilionoidae) flora of Andaman and Nicobar Islands, India

Fouziya Saleem, M. Anil Kumar, Gautam Anuj Ekka and Lal Ji Singh*

Botanical Survey of India, Andaman and Nicobar Regional Centre, Shri Vijayapuram, Andaman and Nicobar Islands, India.

*Corresponding author's E-mail:- laljisingh1970@rediffmail.com

Abstract

The present paper deals with the additions of legume species of Fabaceae family to the flora of Andaman and Nicobar Islands. The detailed description along with phenology, habitat, ecology and, distributional range are discussed. The species belong to four different genera viz., *Alysicarpus* Desv., *Aphyllodium* (DC.) Gagnep., *Sesbania* Adans. and *Tephrosia* Pers. which are described here for the first time from Andaman and Nicobar Islands, India.

Key words: *Alysicarpus*, *Aphyllodium*, *Fabaceae*, *Sesbania*, *Taxonomy*, *Tephrosia*

Introduction

The legumes are distributed throughout the country including Andaman and Nicobar Islands (ANI). ANI is floristically very rich and unique phytogeographical region in India with higher number of endemism (Singh et al. 2014, 2020 a, b, 2021 a, b; Singh & Misra 2020; Singh 2021; Singh & Ranjan, 2021) were legumes flora recorded time to time by various workers (Naik and Singh 2020; Sivaramakrishna et al. 2021, Saleem et al. 2023 a b c, 2024). Authors during their recent floristic survey four interesting Fabaceaceous legumes were collected. On the scrutiny of literature and critical examination the identity of specimens were confirmed as *Alysicarpus bupleurifolius* v var *bupleurifolius* (Edgew.) Baker, *Aphyllodium biarticulatum* (L.) Gagnep., *Tephrosia pumila* (Lam.) and *Sesbania speciosa* Taub. Ex Engl. of fabaceae, hitherto unrecorded from ANI (Vasudeva Rao., 1986; Sanjappa, 1992; Lakshminarasimhan & Rao, 1996; Hajra et al. 1999; Pandey & Diwakar, 2008; Singh et al 2014, 2021b; Murugan et al., 2016; Naik et al., 2021; Naik & Singh 2020; Singh & Ranjan 2021). Hence these four taxa are found to be additions to the Legume flora of ANI of them three species viz *Alysicarpus bupleurifolius* var *bupleurifolius* (Edgew.) Baker, *Aphyllodium biarticulatum* (L.) Gagnep., and *Tephrosia pumila* (Lam.) Pers. is restricted only in Nicobar group of Islands whereas *Sesbania speciosa* Taub. Ex Engl., is distributed throughout the Islands. All these taxa were enumerated in alphabetical order, brief description, phenology, habitat and distribution are provided for all the species.

Material and methods

During floristic explorations in Andaman and Nicobar Islands, the authors came across four interesting plants of Fabaceae from the Grasslands and forested areas. After critical study, perusal of relevant literature and consultation of Herbarium specimens housed at CAL, PBL and digital herbaria (eFloras, 2008; GBIF, 2020; JSTOR, 2020; POWO, 2019; The Herbarium Catalogue, 2021; The Plant List, 2013; WCSP, 2012), the authors identified as *Alysicarpus bupleurifolius* var *bupleurifolius* (Edgew.) Baker, *Aphyllodium biarticulatum* (L.) Gagnep., *Sesbania speciosa* Taub. Ex Engl., and *Tephrosia pumila* (Lam.) Pers. and revealed that these taxa have so far not been recorded and reported from Andaman and Nicobar Islands. Hence, these species reported here as a new record for ANI. Detailed description and photographs are provided here for easy identification. Representative specimens are deposited in PBL.

Result and Discussion

Taxonomic Treatment

1. ***Alysicarpus bupleurifolius*** (L.) DC., Prodr. 2:352. 1825 var ***bupleurifolius*** (Edgew.) Baker in Hook. f., Fl. Brit. India, 2: 155. 1876. *A. gracilis* Edgew., J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 21: 170. 1853.

Erect herbs, upto 60 cm high; stems much branched, glabrous. Leaves simple; petioles ca 2 mm long; stipules linear, acute, 4–15 mm long, glabrous; lamina linear–

oblong, or lanceolate, 2.5-7.5 cm long, acute at apex, rounded or cuneate at base, abaxially sparsely pubescent on midvein, adaxially glabrous. Inflorescence lax racemes, 4-12 cm long; peduncles ca 4 cm long; Pedicels 1-2 mm long. Flowers 10-26, binate at each node. Calyx ca 8mm long, tube glabrous, lobes acute, apically ciliate, lanceolate, $2 \times$ twice as long as tube. Corolla pink or violet, ca 5mm long. Standard petals 3-4 mm long; wing petals 3-4 mm long; keel petals attached with wing petals at base, 2-3 mm long. Pods cylindric, 0.5-1.5 cm long, strongly apiculate, glabrous, smooth, 3-7-jointed, constricted between articles.

Flowering & fruiting: July – January.

Habitat & ecology: In dry open Grasslands.

Distribution: **World:** Australia, Burma, Malesia, Sri Lanka, Thailand; **India:** Andhra Pradesh, Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Maharashtra, Rajasthan, Tamil Nadu, Uttar Pradesh; **ANI:** Terassa, Middle Nicobar.

Specimen examined: Andaman and Nicobar Islands: **Middle Nicobar:** Terassa, 25.03.2023, Fouziya Saleem, Anil Kumar Midigesi, Gautam Anuj Ekka 33439 (PBL).

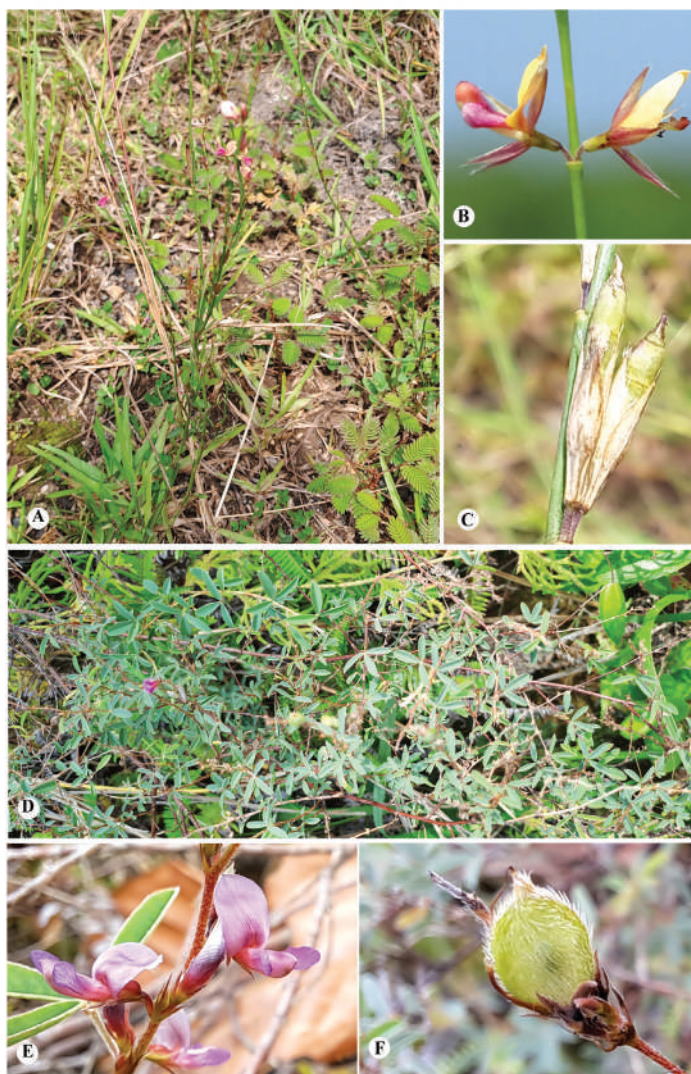


Fig. 1: A-C. *Alysicarpus bupleurifolius* (L.) DC var *bupleurifolius*: A. Habit; B. Flower; C. Pod. D-F. *Aphyllodium biarticulatum* (L.) Gagnep., : D. Habit; E. Flower; F. Pod.

2. **Aphyllodium biarticulatum** (L.) Gagnep., Notul. Syst. (Paris) 3: 254. 1916. *Desmodium biarticulatum* (L.) F. Muell., Fragm. Phyt. Austr. 2: 121. 1861; Baker in Hook. f., Fl. Brit. India 2: 163. 1876; Gamble, Fl. Madras: 344(243). 1918; Sanjappa, Legumes of India: 150. 1992. *Hedysarum biarticulatum* L., Sp. Pl. 2: 747. 1753. *Dicerma biarticulatum* (L.) DC., Prodr. 2: 339.1825.

Erect subshrubs, upto 1m high; branches stiff, glabrous. Leaves 3–foliolate; stipules united, amplexicaul; petioles ca 6 mm long; leaflets coriaceous, oblanceolate–oblong, 4–8mm long, obtuse, adaxially glabrous, cuneate to rounded at base, obtuse at apex, mucronate. Inflorescence terminal raceme, 3–15 cm long. Flowers 2–3 in fascicles, pedicelled, ca 2mm long. Calyx ca 3mm long, scarious; lobes exceeding tube, upper 2 connate, lanceolate. Corolla pinkish or purple. Standard petals ca 6 mm long, not auriculate and clawed; wing petals ca 5mm long, more or less auriculate, claw ca 2 mm long. Ovary puberulent, 2–ovuled; style glabrous. Stamens Monadelphous. Pods biarticulate, ca 1 cm long, both sutures deeply indented; 1–2 jointed; joints round, broadly elliptic to orbicular with dense appressed or spreading hairs, reticulate. Seeds broadly elliptic, ca 2 mm long.

Flowering & fruiting: February– September

Habitat & Ecology: Common in dry grasslands.

Distribution: **World:** Australia, Burma, Malaysia, Myanmar, Malesia, Sri Lanka, Thailand; **India:** Andhra Pradesh, Gujarat, Kerala, Madhya Pradesh, Odisha, Tamil Nadu; **ANI:** Middle Nicobar.

3. **Specimen examined:** Andaman and Nicobar Islands: **Middle Nicobar:** Kamorta, 20.02.2023, Fouziya Saleem, Anil Kumar Midigesi, Gautam Anuj Ekka 35379 (PBL).

Sesbania speciosa Taub. Ex Engl., Abh. Konigl. Ges. Wess Gottingen 21 : 42. 1894 & Engl., Pflanzen. Ost–Afrikas C: 213. 1895; J.B. Gillett in Kew Bull. 17:119. 1963; K.M.Mathew, Mat. Sanjappa, Legumes India: 244. 1992.

Shrubs, 5–6 m high; branchlets densely pubescent. Leaves 25–30 cm long; leaflets 16–26 pairs, opposite, oblong–epilptic, 1–3 cm long, obtuse at base, apiculate at apex, woolly; stipules auriculate, 1.5 cm long, persistent, appressed woolly; petiole 5mm long; petiolule 2mm long, woolly; stipels 1.5 mm long, filiform. Inflorescence axillary raceme, 10–15 cm long; peduncle 4 cm long; pedicles 1.5 cm long, slender; bracts 8 mm long. Flowers lax, 3 cm across. Calyx–tube 6 mm long; teeth triangular, 1mm, acute. Corolla golden yellow; standard petal orbicular, 3 cm, without lateral appendages; wings oblong, 3cm; keels 3cm. Staminal tube 2 cm. Ovary subsessile, 2.5 cm, densely pubescent; styles incurved, 1 cm; stigmas capitate. Pods 30–35 cm, tetrangular, margins grooved, beak spiny; seeds subreniform, 4 mm diam, brownish.

Flowering & Fruiting: Almost throughout the year.

Habitat & ecology: Along the banks of paddy fields and also in grasslands.

Distribution: Africa; **INDIA:** Andhra Pradesh, Karnataka, Kerala, Tamil Nadu; **ANI:** Throughout Andaman and Nicobar Islands.

Specimen examined: Andaman and Nicobar Islands: **Middle Andaman:** Rangat, 17.12.2021, Fouziya Saleem 33422; **South Andaman:** Ograbraj, 25.01.2022, Fouziya Saleem 33464; **Middle Nicobar:** Kamorta 22.01.2023 Fouziya Saleem, Anil Kumar Midigesi, Gautam Anuj Ekka 35380 (PBL); Terassa 25.01.2023 Fouziya Saleem, Anil Kumar Midigesi, Gautam Anuj Ekka 35375 (PBL); **South Nicobar:** Great Nicobar, 12 Km, 27.03.2022 Fouziya Saleem 35329.

Tephrosia pumila (Lam.) Pers., Syn.Pl. 2:330. 1807; Baker in Hook., Fl. Brist. India 2 : 113. 1876; Sanjappa, Legumes India: 257. 1992. *Galega pumila* Lam., Encycl. 2: 599.1788. *Tephrosia purpurea* (L.) Pers. var. *pumila* (Lam.) Baker in Hook.f., Fl. Brit. India 2: 113. 1876. *T. Procumbens* Buch. – Ham. ex J.R. Drumm. In Gamble. Fl. Madras: 320 (226). 1918, non Macfad. 1837. *T. diffusa* Wight & Arn., Prodr. Fl. Ind. Orient.: 213. 1834.

Prostrate herbs, up to 70 cm long; branches sericeous, velutinous. Leaves imparipinnate, 7–13 foliolate; rachis

ca 3cm long, including petioles ca 6mm long; leaflets chartaceous, obovate to oblanceolate, 8–10mm long, cuneate at base, truncate or emarginate and mucronate at apex, margins entire; petiolules ca 1 mm long; stipules linear, setaceous, ca 3–4 mm long. Inflorescence leaf opposed, lax racemes, up to 2 cm long; bracts ca 4 mm long. Flowers 1–3, 6mm across; pedicels 1 mm long. Calyx tube 1 mm long; lobes lanceolate, 1.5 mm long,

sparsely pubescent. Corolla white or purplish; standard petals orbicular, ca 4 mm, tomentose; wing petals oblong, ca 2 mm long; keel petals ca 3 mm long. Staminal-tube ca 4 mm long; free filaments to 1mm long. Ovary ca 4 mm long, densely tomentose; style to 2 mm long, glabrous. Pods linear- oblong, 2–4 cm long, faintly hairy. Seeds 8–14, brown, oblong–rhomboid, ca 4 mm in diam., mottled.

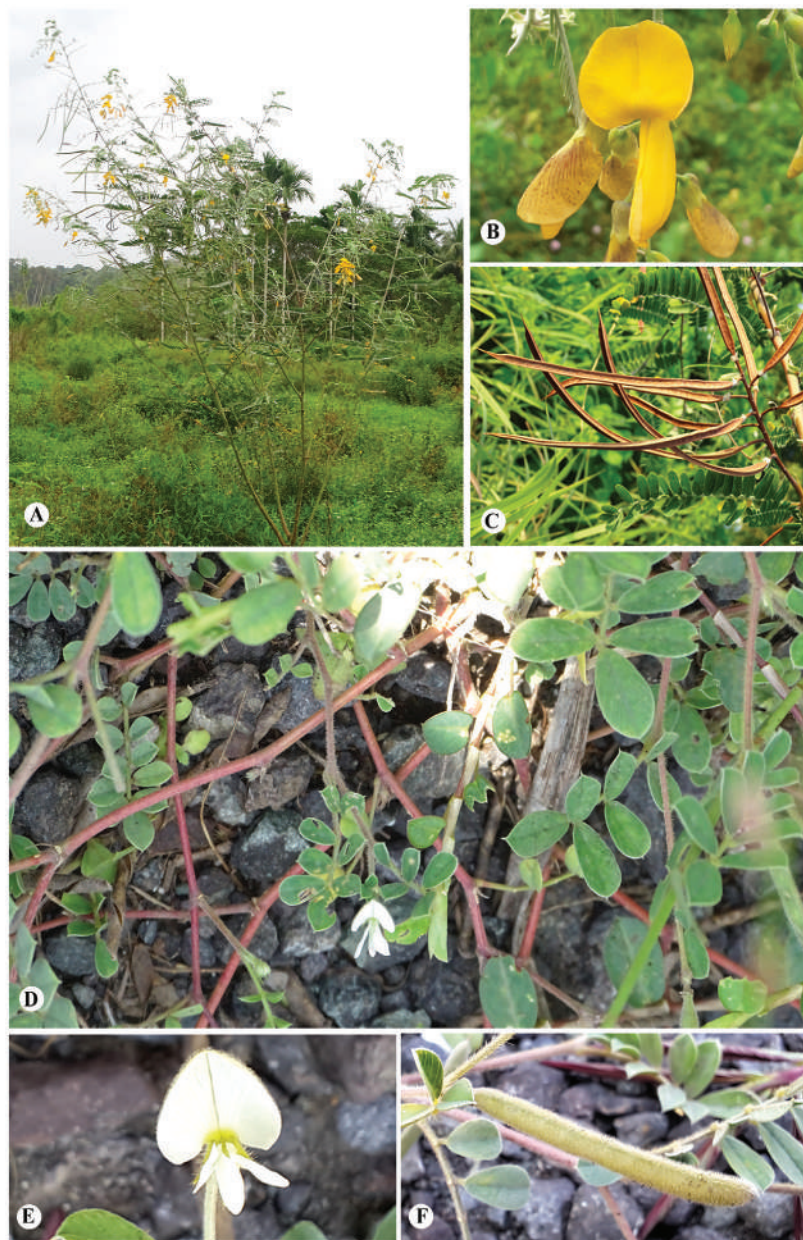


Fig.2: A-C. *Sesbania speciosa* Taub. Ex Engl.: A. Habit; B. Flower; C. Pod. D-F. *Tephrosia pumila* (Lam.) Pers.: D. Habit; E. Flower; F. Pod.

Flowering & Fruiting: November – March.

Habitat & ecology: In wastelands and dry rocky areas.

Distribution: Australia, Burma, Malesia, Sri Lanka, Thailand; **INDIA:** Almost throughout India; **ANI:** Middle Nicobar.

Specimen examined: Andaman and Nicobar Islands: **Middle Nicobar:** Terassa, 25.01.2023 *Fouziya Saleem, Anil Kumar Midigesi, Gautam Anuj Ekka* 35374 (PBL).

Discussion

These species possesses a very dry areas like grasslands and rocky areas with distinct soil texture in the tropical zone of Islands. Their growth is usually in patches or secluded populations. Further, extensive floristic surveys are essential for spotting the new localities for assessment of conservation measures.

Acknowledgments

The authors are grateful to the Director, Botanical Survey of India, Kolkata for constant support. Authors are thankful to the Department of Environment and Forests, Andaman and Nicobar Islands for giving necessary permission and providing logistic support during the field studies. The authors are thankful to Dr. Debasis Bhattacharya, Editor in-Chief, Journal of Andaman Science Association and anonymous reviewers for critical comments and suggestions that helped to improve the manuscript. Thanks are due to scientists and staff of Botanical Survey of India, Andaman and Nicobar Regional Centre for their time to time help.

References

- eFloras. (2008). Missouri botanical garden, St. Louis, MO. Harvard University Herbaria. <http://www.efloras.org>
- GBIF. (2020). GBIF backbone taxonomy. <https://www.gbif.org/species>
- Hajra, P.K., Rao, P.S.N. & Mudgal, V. (1999). Flora of Andaman-Nicobar Islands (Ranunculaceae – Combretaceae) Botanical Survey of India, Calcutta, 1, pp. 1-487.
- JSTOR (2020). Global plants. JSTOR, Ithaka, <<https://plants.jstor.org/>>, accessed 28 July 2020.
- Lakshminarasimhan, P. & Rao, P.S.N. (1996). A supplementary list of Angiosperms recorded from Andaman and Nicobar Islands. *Journal of Economic and Taxonomic Botany* 20:175-185.
- Murugan, C., Prabhu, S., Sathiyaseelan, R. & Pandey, R. P. (2016). A Checklist of Plants of Andaman and Nicobar Islands. ENVIS Centre on Floral Diversity. Botanical Survey of India, Kolkata.
- Naik, M.C. & Singh, L.J. (2020). Two legume species additions to the flora of Andaman & Nicobar Islands, India. *Abrahamia* 5(1): 1–4.
- Naik, M.C., Singh, L.J. & Ganeshaiah, K.N. (2020). Floristic diversity and analysis of South Andaman Islands (South Andaman District), Andaman & Nicobar Islands, India. *Species*, 21(68): 343– 409.
- Pandey, R. P. & Diwakar, P. G. (2008). An integrated checklist of plants in Andaman & Nicobar Islands, India. *Journal of Economic and Taxonomic Botan*, 32: 403–500.]
- POWO. (2019). Plants of the world online. Facilitated by the Royal Botanic Gardens, Kew. www.plantsoftheworldonline.org/
- Rao, M. K. V. (1986). A preliminary report on the angiosperms of Andaman and Nicobar Islands. *Journal of Economic and Taxonomic Botany* 8: 107–184.
- Saleem, F., Singh, L.J.& Pandey, A.K. (2023a). Two additions to the Legumes Flora of Andaman and Nicobar Islands, India. *J. Andaman Sci. Assoc.* 28(1): 40–46.
- Saleem, F., Singh, L.J.& Pandey, A.K. (2023c). *Teramnus* P. Browne (Papilionadeae- Leguminosae) - A new addition to flora of Andaman and Nicobar Islands, India. *Journal of the Andaman Science Association* 28(2):188-192.
- Saleem, F., Singh, L.J.& Pandey, A.K. (2024). *Crotolaria andamanica* (Fabaceae): A new species of Rattle pod from Andaman and Nicobar Islands, India. *Taiwania*. 69(1): 67–73, 2024

- Saleem, F., Singh, L.J., Subramaniam, S., Pandey, A.K. (2023b). *Crotolaria nicobarica* (Fabaceae): a new species from Andaman and Nicobar Islands, India. *Nor. J. Bot.* DoI: 10.1111/njb.04077.
- Sanjappa, M. (1992). Legumes of India. Bishen Singh Mahendra Pal Singh, Dehra Dun.
- Sanjappa, M. (2020). Fabaceae (=Leguminosae, nom alt.). In: Ashiho Asosii Mao and Sudhansu Sekhar dash (Eds.), Flowering Plants of India, An Annotated Checklist (Dicotyledons).1:300-446.
- Singh, L. J. (2021). *Septemeranthus* (Loranthaceae), a new monotypic genus from the Andaman and Nicobar Islands, India and its relationship with allied genera *Feddes Repertorium*. 132:193–203.
- Singh, L. J., Murugan, C. & Singh, P. (2014). Plant Genetic Diversity of Endemic Species in the Andaman and Nicobar Islands – In: *Nat. Conf. On Islands Biodiversity, U. P. State Biodiversity Board, Lucknow* 49-57.
- Singh, L.J. & Misra, D.R. (2020). Reappraisal of the genus *Cycas* L. (Cycadaceae) in Andaman and Nicobar Islands, India. – *Indian Journal of Forestry*. 43(1):46-57.
- Singh, L. J., Ekka, G.A., Sanjay Mishra, S., Vivek, C.P., Shankar, V.S. Naik, M.C. & Saleem F. (2020a). Habitat status of *Musa paramjitiana* L.J. Singh (Musaceae): a critically endangered, endemic species in Andaman and Nicobar Islands, India. – *Pleione* 14(1):121 - 127.
- Singh, L. J., Dwivedi, M.D., Kasana, S., Naik, M.C., Ekka, G.A. & Pandey, A.K. (2020b). Molecular systematics of the genus *Musa* L. (Zingiberales: Musaceae) in Andaman and Nicobar Islands. *Biologia*.
- Singh, L. J., Ranjan, V. (2021). *New Vistas in Indian Flora*. vol. 1 & 2: Bishen Singh Mahendra Pal Singh, Dehra Dun, Uttarakhand, India, pp. 417& 819.
- Singh, L. J., Ekka, G.A., C.P. Vivek, Misra, D.R. 2021a. Gymnosperms of the Andaman and Nicobar Islands: An Overview (In:eds. L.J. Singh & V. Ranjan, *New Vistas in Indian Flora*. Bishen Singh Mahendra Pal Singh, Dehra Dun, India, 1: 265-278.
- Singh, L. J., Ranjan V., Sinha, B.K., Mishra, S., Purohit, C.S. Vivek C.P., Naik, M. C. & Ekka, G.A. (2021b). An Overview of Phytodiversity of the Andaman and Nicobar Islands, India. (In:eds. L.J. Singh & V. Ranjan, *New Vistas in Indian Flora*. Bishen Singh Mahendra Pal Singh, Dehra Dun, India, 2: 381- 399.
- The Herbarium Catalogue. (2021). Royal Botanic Gardens, Kew. www.kew.org/hercat.
- The Plant List. (2013). Ver. 1.1. www.theplantlist.org/
- Turner, R. J. (1991). Mistletoe in eucalypt forest a resources for birds. *Australian Forestry*, 54, 226–235.
- WCSP. (2012). World checklist of selected plant families. Facilitated by the Royal Botanic Gardens, Kew. <http://wcsp.science.kew.org>