

# Rediscovery and taxonomy of a rare species *Disperis monophylla* (Orchidaceae)

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## Abstract

*Disperis monophylla* Blatt. ex C.E.C. Fisch. has been rediscovered after 96 years from the type location, and detailed description, key to the species, photographs and taxonomic notes are provided for the better understanding of the species.

**Key words:** *Disperis monophylla*, lectotype, Megamalai, Tamil Nadu, Western Ghats.

## Introduction

Genus *Disperis* Sw. belongs to the family Orchidaceae, represented by a total of 81 accepted species, chiefly distributed in the Africa, Tropical & Subtropical Asia to NW Pacific (POWO 2024). The genus is well known for its extremely complicated flower morphology and structure; with various fused floral parts and highly elaborated lip bearing appendages (Kurzweil, Linder 1991; Kurzweil 2005). *Disperis monophylla* was first collected by Blatter and Hallberg in May 1917 from a single population in the High Wavy mountains of Madurai district (currently in Theni district), Tamil Nadu. This collection, comprising 11 individuals, initially part of the herbarium at St. Francis Xavier's College in Bombay, was subsequently presented to the herbarium at the Royal Botanic Gardens, Kew by Blatter in July 1927 with the field no 345 (barcoded K000078865). Blatter initially annotated his collection as “very near *D. zeylanica* Trimen” and later published a lengthy description of it, with an illustration of the labellum, under the name *Disperis neilgherrensis* Wight, in his annotated checklist of the orchids collected by himself and Hallberg during May 1917 in the High Wavy Mountains (Blatter 1928). The original collection was clearly stated at that time to be at Kew (Kurzweil 2005).

At some stage, however, Blatter evidently revised his identification of the collection, annotating his specimen as “*Disperis monophylla* Blatter sp. nov.”. This species was published under this name as distinct from *D. neilgherrensis* by Fischer (1928) in his treatment of the family for the Flora of the Presidency of Madras. Although Fisher (1928) does not include a complete description of the taxon and instead references the concurrent description of the collection by Blatter (1928) it does include a couplet diagnosing *D. monophylla* against *D. neilgherrensis*. This is adequate for

valid publication of the name (ICN Art. 38.1: Turland et al. 2018). The Hallberg and Blatter collection is cited without herbarium but it is quite clear that there was only ever this single collection and it therefore qualifies as the holotype of the name (ICN Art. 9.1: Turland et al. 2018).

The confusing nature of the publication of the name *Disperis monophylla* has therefore led to it being either ignored or treated as a synonym of *D. neilgherrensis* (Kurzweil, Manning 2005; Nayar et al. 2014; Kar et al. 2017; Narasimhan, Irwin 2021; Karuppusamy et al. 2022). The type of the name at Kew represents the only original material of the species and the taxon is not represented in any Indian Herbaria (MH, CAL, BSID and RHT). It was therefore also excluded from the recently published book on Orchids of India (Singh et al. 2019). Here we report on the second known collection of this rarity, representing the first collection since it was collected 96 years ago, confirming the rarity of this orchid in natural habitat.

## Materials and methods

During a recent floristic exploration of Megamalai Wildlife Sanctuary (now in Srivilliputhur–Megamalai Tiger Reserve), southern Western Ghats of Tamil Nadu, India, the authors collected specimens of the terrestrial orchid genus *Disperis* from fringe forests in the edges of tea estates above 1000 m mean sea level. This plant material was processed for the herbarium by the standard prescribed method (Jain, Rao 1977) and herbarium specimens were deposited at SGH, The Department of Botany, The Madura College, Madurai. Morphological characters were studied and micromorphological characters analysed under the stereomicroscope for preparation of illustrations. After a critical examination of the collected specimens and the pertinent literature (Blatter 1928; Fischer 1928;

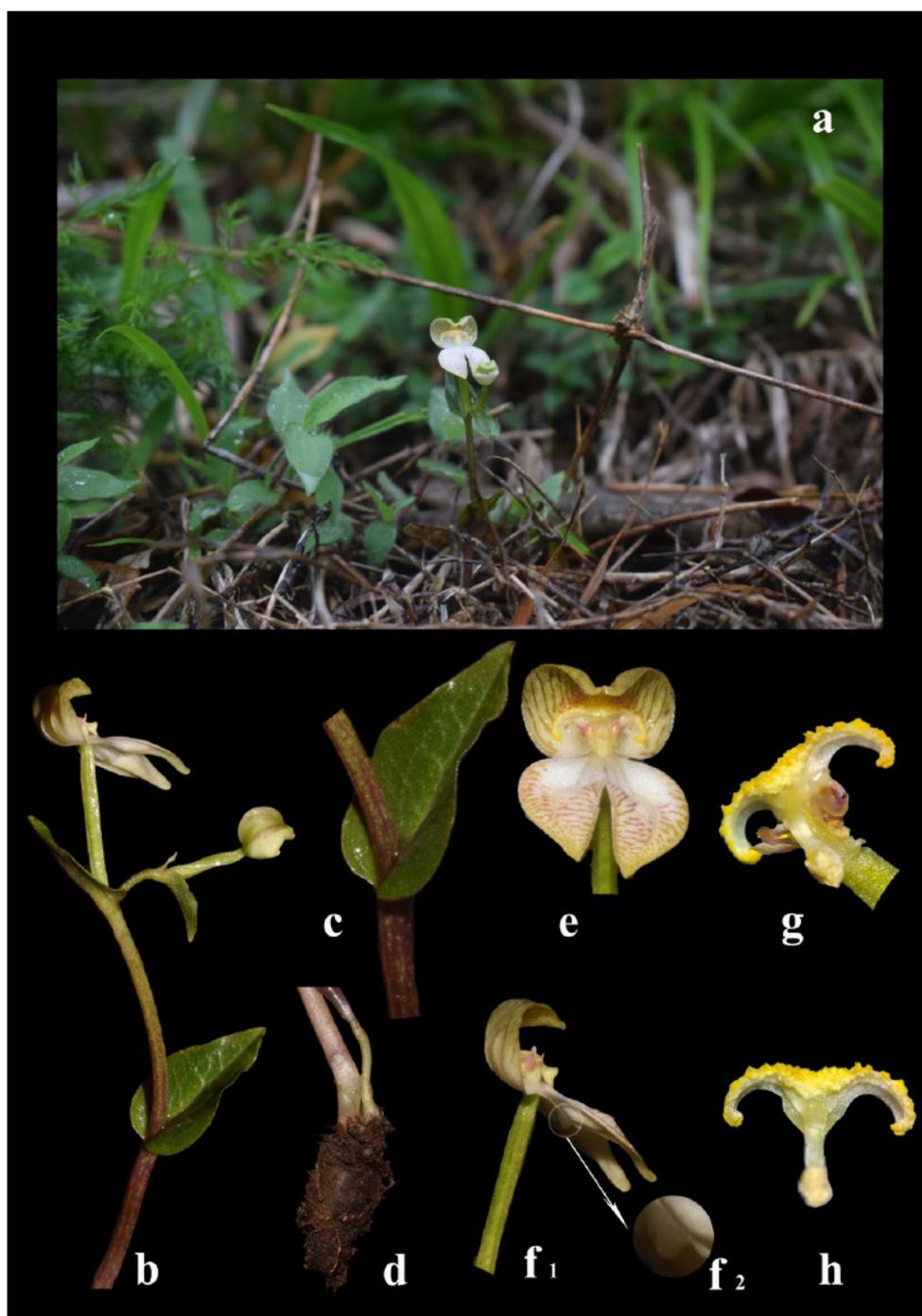
barcoded K000078865), and comparison with the type of *D. monophylla* at Kew, we identified our material as representing that species. This represents the second collection of the taxon after the after-type collection, and the first for 96 years. A detailed description, key characters separating it from *D. neilgherrensis*, photographs and taxonomic notes are provided for the better understanding of the species.

## Results

### *Taxonomic treatment*

*Disperis monophylla* Blatter ex C.E.C. Fisch., Fl. Madras 3(8): 1477(-1478) (1928) (Fig. 1). Holotype: INDIA: High Wavy mountains, May 1917, Blatter & Hallberg 345 (K [000078865]-image!) (Fig. 2).

Terrestrial herb with underground tubers; tubers small, elongated, obliquely ellipsoid, to 25 mm long and 15–20



**Fig. 1.** *Disperis monophylla* Blatter ex C.E.C. Fisch. a, habitat; b, habit; c, leaf; d, tuber; e, front view; f<sub>1</sub>, side view; f<sub>2</sub>, saccate spur; g, lip and gynostemium; h, lip. Photos by P. Bharath Simha Yadav, at Megamalai Wildlife Sanctuary, on 13 July 2024.

mm diam. Stem erect, 20 – 23 mm long, stout, fleshy, with a single cataphyll. Leaf solitary, inserted in the upper half of third of stem, sessile, broadly ovate-cordate, 15 – 25 × 10 – 15 mm, base amplexicaul, apex subacute, margin sub-

entire and undulate. Inflorescence lax, 1 or 2(3)-flowered, bracts leaflike, 25 × 10 mm. Flowers resupinate, greenish white with green stripes when young but white with purple stripes at maturity; pedicel and ovary not clearly

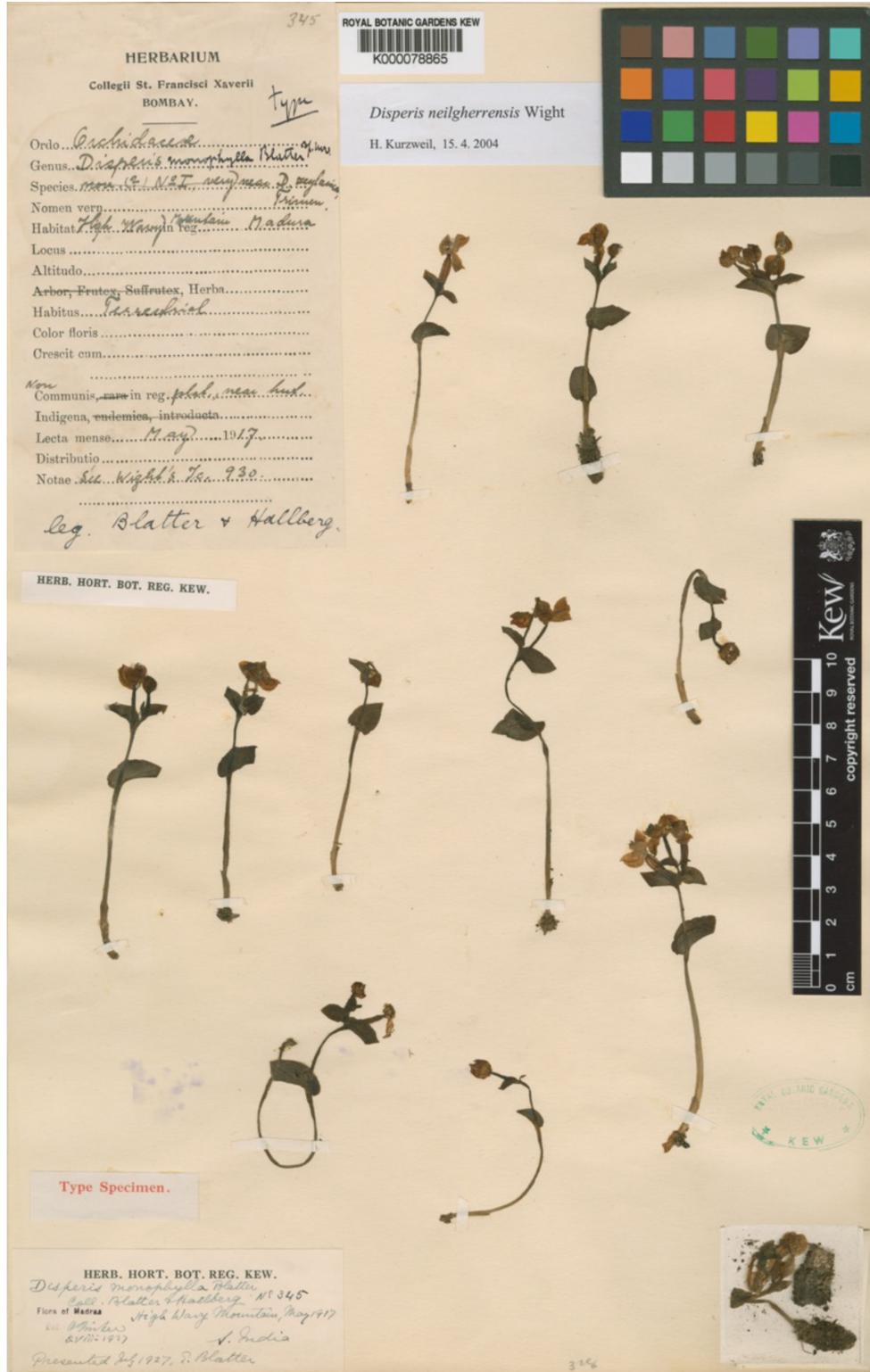
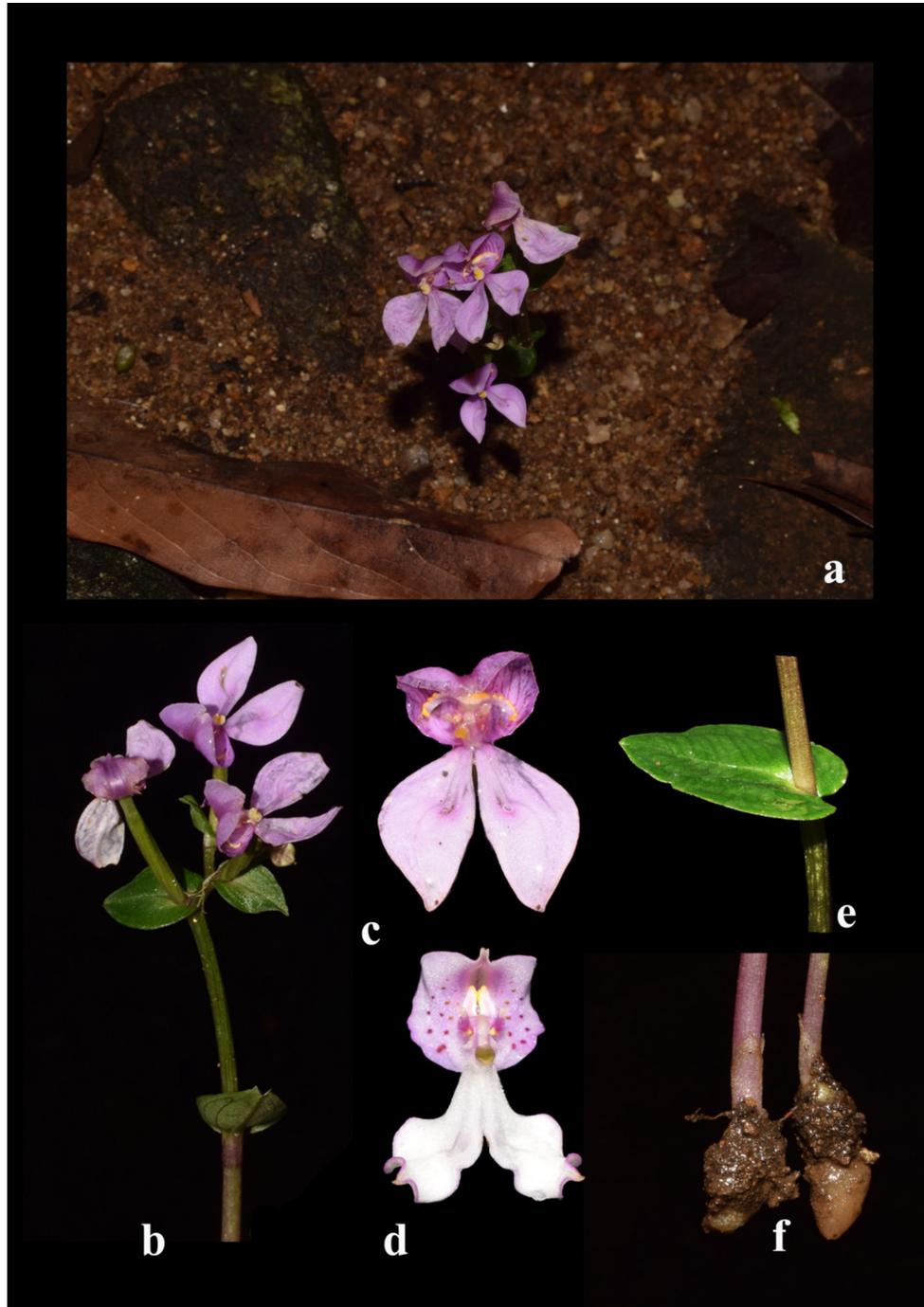


Fig. 2. Type sheet for *Disperis monophylla* ( K000078865). © The Board of Trustees of the Royal Botanical Gardens, Kew.



**Fig. 3.** *Disperis neilgherrensis* Wight. a, habitat; b, habit; c & d, front view of flower (variations, c: from Kalakkad Mundanthurai Tiger Reserve, Tamil Nadu and d: from Nilgiris Biosphere Reserve of Tamil Nadu); e, leaf; f, tuber. Photos by P. Bharath Simha Yadav.

differentiated, cylindrical, 15 – 18 mm long. Dorsal sepal narrowly lanceolate, 3-nerved, rather obtuse, adhering to the petals and forming a concave hood 10 mm diam. Lateral sepals spreading, connate at base  $\pm$  3 mm long, limbs broadly ovate-falcate, 5 – 12  $\times$  5 – 6 mm, with small saccate spur near base. Petals broadly falcate, 8  $\times$  4.5 mm, margin minutely papillose, slightly wavy, incurved at apex. Lip 3-lobed, ypsiloid or Y-shaped, with a narrow claw 2.0 – 3.2 mm long adnate basally with gynostemium, lip

appendages as two lateral spreading-recurved horn-like processes, tomentose. Gynostemium 2 – 3 mm long; anther reflexed, 1.5 – 2.0 mm long, with parallel adjacent theca; auricles small; central rostellum lobe flat and covering anther, emarginate apically, arms filiform and lorate, 1.5 – 2.5 mm long.

*Habitat*

Evergreen forest above 1000 m mean sea level.

### Distribution and ecology

A narrow endemic of the High Wavy Mountains, Megamalai Wildlife Sanctuary, Theni district, Tamil Nadu. *Disperis monophylla* growing among mosses and humus in the shade of the evergreen forests. Co-occurring species include *Adiantum raddianum*, *Henckelia missionis*, *Selaginella* sp., *Asparagus racemosus*, grasses and mosses.

### Phenology

Flowering and fruiting specimens have been collected in May and July.

### Additional specimen examined

India, Tamil Nadu, Megamalai Wildlife Sanctuary, High Wavys, 13 July 2024, Karuppusamy & P. Bharath Simha Yadav 3690 (SGH).

### Note

*D. monophylla* is similar to the *D. neilgherrensis* but differs from that species in the solitary (vs. 2) cataphyll, mostly solitary (rarely 2) leaf (vs. 1 to 3), greenish flowers with purple veins (vs. pinkish or reddish with crimson spots), and lateral sepals with a small basal spur (vs. unspurred) (Fig. 1 and 3).

### Key to the two species

1. Basal sheaths 2; leaves usually 2 or 3; flowers pinkish to reddish with crimson red spots; lateral sepals without saccate spurs; caudicle and staminal tubes twisted .....*D. neilgherrensis*.
2. Basal sheath single; leaves usually solitary, rarely 2; flowers greenish and white at base with purplish veins; lateral sepals with saccate spurs; caudicle and staminal tubes not twisted .....*D. monophylla*.

### Conservation status

The recent re-collection of this orchid and the re-assessment of its taxonomic status has remarkable relevance for the conservation of the flora of the Western Ghats since it appears to be a narrow endemic of the High Wavys in Megamalai Wildlife Sanctuary with approximately 150 individuals. The area is under heavy anthropogenic pressure and the only known occurrence of this orchid is in a habitat near a human settlement, tea plantations and tourism activities. The current conservation assessment of this species is DD (IUCN 2024-1). Further study is necessary to check the population status and reproductive trends to confirm the green status of the species.

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### References

- Blatter E. 1928. A list of orchids, with some new species from the High wavy Mountains (Madura District). *J. Bombay Nat. Hist. Soc.* 32: 518–523.
- Fischer C.E.C. 1928. *Flora of the Presidency of Madras*. Vol. 3(8). London.
- IUCN. 2024. The IUCN Red List of Threatened Species. Version 2024-1. <https://www.iucnredlist.org>. Accessed on 24.07.2024.
- Jain S.K., Rao R.R. 1977. *A Handbook of Field and Herbarium Methods*. Today & Tomorrow's Printers and Publishers, New Delhi.
- Kar T., Mohan M., Mandal K.K. 2017. *Disperis* and *Epipogium* (Orchidaceae): two new generic record for the flora of Odisha. *Nelumbo* 59: 159–163.
- Karuppusamy S., Prasad K., Pullaiah T. 2022. *Orchids of Tamil Nadu, India*. Scientific Publishers, Jodhpur, India.
- Kurzweil H., Linder H.P. 1991. A comparative study of the floral morphology in the genus *Disperis* (Orchidaceae). *Beitr. Biol. Pflanzen* 66: 433–477.
- Kurzweil H. 2005. Taxonomic studies in the genus *Disperis* (Orchidaceae) in Southeast Asia. *Blumea* 50: 143–152.
- Kurzweil H., Manning J.C. 2005. A synopsis of the genus *Disperis* Sw. (Orchidaceae). *Adansonia Ser.* 3 27: 155–207.
- Narasimhan D., Irwin S.J. 2021. *Flowering plants of Tamil Nadu: a Compendium*. Cape Earth Trust, Chennai.
- Nayar T.S., Begam A.R. & Sibi M. 2014. *Flowering Plants of The Western Ghats, India*. Vol. 1. Jawaharlal Nehru Tropical Botanical Garden and Research Institute, St. Joseph's Press, Thiruvananthapuram.
- POWO. 2024. Plant of the World Online. *Disperis* Sw. <https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:29310-1>.
- Singh S.K., Agrawala D.K., Jalai J.S., Das S.S., Mao A.A., Singh P. 2019. *Orchids of India – a Pictorial Guide*. Botanical Survey of India, Kolkata, India.
- Turland N.J., Wiersema J.H., Barrie F.R., Greuter W., Hawksworth D.L., Herendeen P.S., Knapp S., Kusber W.-H., Li D.-Z., Marhold K., May T.W., McNeill J., Monro A.M., Prado J., Price M.J., Smith G.F. (Eds.) 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>.