Research Article

The Identity of the Herb ‘*Todda–Vaddi*’ in Van Rheedee’s *Hortus Malabaricus*

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ABSTRACT

The ambiguity in the botanical identity of *Todda-vaddi* in van Rheedee’s *Hortus Malabaricus* is clarified and reinstated as *Biophytum reinwardtii* (Zucc.) Klotzsch. A detailed description, photographs, and other relevant notes are provided.

Keywords: *Biophytum reinwardtii*, *B. candolium*, *Todda-vaddi*, *Hortus Malabaricus*

Introduction

The *Hortus Malabaricus* (meaning "Garden of Malabar") is a comprehensive botanical treatise compiled by Dutch Governor Hendrik Adriaan van Rheedee, published in twelve volumes between 1678 to 1693, it is the first authentic work on the medicinal plant resources of Malabar, the area principally covering the West Coast and the Western Ghats of peninsular India now in the state of Kerala. In volume IX of this work, Van Rheedee has illustrated a plant called ‘*Todda–Vaddi*’ (in Malayalam, Supplementary 1, Figure 1) used by the local people as a remedy against wounds, ulcers, and kidney stones [1]. Linnaeus used this figure (t.19.p.33–34) and descriptions and the other specimens he received from the East while describing his *Oxalis sensitiva* in 1753 [2]. The latter was the only species known to him at that time. According to him, all *Oxalis* taxa sensitive to touch belonged to *O. sensitiva*. Later in 1824, De Candolle transferred it to *Biophytum*, viz. *B. sensitivum* (L.) DC. [3].

Joseph Gerhard Zuccarini, a German botanist, described *Oxalis reinwardtii* Zucc. based on specimens collected by C.G.C. Reinwardt from

Indonesia in 1825. He has mentioned its distribution in “Insular Java and the Malabar”, and cited Rheedee’s *Todda–Vaddi* as a synonym under his species. An image of the type specimen of *O.reinwardtii* can be accessed from the website of Botanische Staatssammlung München Germany (M) (<https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.m0172355>). Johann Friedrich Klotzsch (1861) transferred *O.reinwardtii* to *Biophytum* viz. *B. reinwardtii* (Zucc.) Klotzsch [4]. This treatment has been accepted by several botanists, including Edgeworth & Hooker [5] and Gamble [6]. Jan Frits Veldkamp [7], however, interpreted Rheedee’s *Todda-vaddi* as *B. candolium* Wight [8] for the first time. Since then, all recent Floras from south India, including the English translation of *Hortus Malabaricus* by Manilal [9] considered Rheedee’s *Todda-vaddi* as *B. candolium*.

Biophytum reinwardtii and *B. candolium* are morphologically similar, with unbranched stems and yellow petals with red veins. But they can be distinguished in several other features (Table 1). Since a preserved specimen represent-

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ing Van Rhee de's Todda-vaddi is absent, his illustration is the only reference available for comparison. In Rhee de's figure, the pedicels are many times exceeding the calyx in their length. This is a strong character that can be used to distinguish *B.reinwardtii* from *B.candolianum*. Both species are sympatric in the higher altitudes of Kerala and Tamil Nadu states of southern India. Whereas in *B. candolianum*, the pedicels are always shorter than the calyx. Hence the earlier concept of considering *Todda-vaddi* as *B.reinwardtii* is followed here.

Material and Methods

The present work is based on an examination of the relevant literature and field study of living plants as well as herbarium specimens housed at E and M through high-resolution images accessed at <https://jstor.org>. Several accessions of herbarium specimens housed at TBGT have also been studied for the preparation of the description. Photographs of the plants were taken from their original habitats.

Results and Discussions

Biophytum reinwardtii (Zucc.) Klotzsch in

Peters, Naturw. Reise Mossambique 6(1):85.1861.

Oxalis reinwardtii Zucc., Abh. Math.-Phys. Cl. Konigl. Bayer. Akad. Wiss. 1:274.1831. Type: INDONESIA: 01.01.1825, Reinwardt, C.G.C., s.n. (M-image!).

Todda-Vaddi Rhee de Hort. Malab. IX. p.33. tab. 19. 1689.

Annual herbs up to 15 cm long, stem pubescent. Leaves 10-20 jugate; rachis 4-10 cm long, sparsely puberulous; leaflets overlapping, terminal largest, up to 13 × 5 mm, asymmetric, obovate. Flowers umbellate in many-flowered axillary peduncles; pedicels up to 6 mm long; bracts ovate-attenuate, 1-2 mm long. Sepals 2-4 × 1-1.3 mm, ovate-lanceolate, acute-acuminate at apex, 5-7-nerved, half as long as petals in flower, 2/3 as long as in fruits. Petals yellow, 3.5-4.5 mm long, elliptic to oblanceolate, emarginate at apex; claw greenish, limb yellow. Fruits 3-3.5 × 2-2.5 mm, glandular-hairy on the ribs; seeds 1-2 per cell, up to 1.2 × 0.8 mm, transversely ridged and tubercled.

Distribution: Indo-Malesia to China.

Table 1. Comparison between *Biophytum candolianum* and *Biophytum reinwardtii*.

Characters	<i>Biophytum candolianum</i>	<i>Biophytum reinwardtii</i>
Stem surface	Glabrous	Pubescent
Leaflets	6-15 pairs	10-20 pairs
Terminal leaflet shape	Oblong	Obovate
Lateral leaflet shape	Oblong	Elliptic
Leaflet surface	Strigose	Glabrous or sparsely hairy
Leaflet apex	Apiculate	Cuspidate
Leaflet base	Oblique	Rounded
Bracts length	3 mm	1-2 mm
Bracts shape	Lanceolate	Ovate - Attenuate
Pedicel length	1-2 mm	3-6 mm
Pedicel surface	Glabrous	Glandular-hairy
Sepal shape	Ovate -Lanceolate, acute	Ovate -Lanceolate
Sepal length	4-7 mm	2-4 mm
Sepal venation	3-5	5-7
Sepal surface	Strigose	± Glabrous or occasionally with a few glandular hairs
Petal shape	Lanceolate	Elliptic-Oblanceolate
Petal length	9-11 mm	6-8 mm
Staminal filament length	1-2.5 mm	2-3 mm
Filaments surface	Sparsely hairy	Glabrous
Style surface	Glabrous	Pubescent
Ovary	Apically ciliate	Glabrous
Capsule-shape	Elliptic	Elliptic-Subglobose
Seed colour	Brownish-red	Orange -brown

Note: The name *Todda-Vaddi* is not used now for this species. It is known as Mukkutti in Malayalam. *Todda-Vaddi* is now used for *Mimosa pudica* L., a plant commonly found in Kerala, originally a native of

Biophytum candolium and *B. reinwardtii* can be distinguished by the following characters, as shown in Table 1.

Conclusion

Van Rheede described a common Malabar plant called *Todda-Vaddi* in Hortus Indicus Malabaricus. It was previously interpreted as *Biophytum reinwardtii* through decades by many botanists. But, Veldkamp erroneously applied this name to *Biophytum candolium* with no explanation and that has been followed in several recent works. This created confusion about the taxonomic identification of Rheede's illustration and prompted us to conduct a thorough investigation on the correct identity of *Todda-Vaddi*. The plate depicted an herbaceous unbranched species of *Biophytum* with fairly long pedicels that are many times longer than the sepals. This is a main characteristic feature of *B. reinwardtii*, whereas in *B. candolium*, the flower pedicels are always shorter than sepals. Hence the earlier concept is followed here. Therefore, the correct identification of Van Rheede's figure (t. 19, P. 33, Vol. 9. 1689) of *Todda-Vaddi* (is *B. reinwardtii* (Zucc.) Klotzsch.

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Supplementary 1

A. 'Todda-Vaddi' in Hortus Malabaricus (vol. IX, t.19.1689) Source: <https://www.biodiversitylibrary.org/item/14379#page/53/mode/1up>. B. *Biophytum candolianum* Wight C. *Biophytum reinwardii* (Zucc.) Klotzsch

Figure 1. A. 'Todda-Vaddi' in Hortus Malabaricus (vol. IX, t. 19, 1689). Source: <https://www.biodiversitylibrary.org/item/14379#53/mode/1up>. B. *Biophytum candolianum* Wight C. *Biophytum reinwardii* (Zucc.) Klotzsch.