ASKLEPIOS

126

MARCH 2020

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ISSN 0260-9533

Asklepios 126

The Journal of the
International Asclepiad Society

Founder - A. Woodward

Published March 2020

Published by the International Asclepiad Society three times per subscription year

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Repro & printing by Press Group, Slovakia. All enquiries to be addressed to the Editor. Subscription - £24.00 (€30) per annum (UK and Europe), £28 or US$45 Airmail to all other countries. Advertising rates: ½-page £15; ¼-page £10 – for other sizes please enquire.

INTERNATIONAL ASCLEPIAD SOCIETY

Registered Charity No. 1020277

www.asclepiad-international.org

Front cover: *Ceropegia fusca* in habitat in Tenerife (Ph. Kono Tadayoshi).

Back cover: *Stapelia leendertziae* (Ph. Alan Butler).

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Editorial

Alan Butler - Malaga, Spain.

I seem to be apologising too often these days but seeing that the last issue of Asklepios, Number 125, was published some time ago, I feel I have to explain.

Editing a specialised journal such as Asklepios, is a privilege and a responsibility, and needs a certain skill and dedication. When I took over from the late Phillip Downes over 15 years ago it was to stop the society closing down, and I think you would agree that the quality of our journal, if not the regularity of publication, has improved greatly and has a place in the modern world. However like all specialist publications we have suffered due to the ease of publishing in other media in this digital world and I thank members who have been loyal despite delays with journals and seed lists.

After the IAS meeting in Belgium in 2018, I had hoped that with the new team we could produce journals more often but not wishing to criticise anyone, this has not happened as we all have lives to lead and money to earn and cannot afford the time and stress involved with an extra job. So, where do we go now? I have agreed to edit and produce two more issues to complete the subscription period. This is one and there will be one more. After that I am not sure what happens. I still think it is wrong for a society to have the same editor for so long but at the same time I still feel strongly, as I did all those years ago, that it would be a sin to let the society close. So once again I am asking if there is anyone out there who is willing to help? It would need to be first and foremost someone with contacts in the asclepiad world who can keep an eye on publications and social media and know whom to approach for articles. Don't let me be the last one standing!

Now, moving on to other matters, you may notice that one of the articles in this issue refers to *Ceropegia seminuda* where some might expect to read *Duvalia seminuda.* The policy of the IAS has always been not to get involved in taxonomic issues but to publish articles without comment or criticism provided they are correctly written and checked by our scientific advisors. However some explanation is due to members to understand the latest proposal to reclassify all succulent asclepiads in one big genus *Ceropegia,* an idea supported by Peter Bruyns and others.

The Linnaean system of binomials was introduced to add clarity for identification and classification and has worked well. Fairly recent developments in the extraction and analysis of DNA has enabled us to better see relationships between the genera and the evolutionary tree, but trying to merge these results with the Linnaean system is fraught with difficulty and some compromises are needed, especially as the tree can be carved up in various ways. Classification should reflect shared descent in the ideal world, but when this conflicts with the other function of classification, namely aiding recognition of recognisable groups of species sharing morphology, then some pragmatism is required. The sensible approach shared by many writers is to acknowledge that the stapeliads evolved from a broad *Ceropegia* while retaining the traditional stapeliad genera to aid identification and communication.

I thank Dr David Goyder for his explanation and his view on this controversial subject.

I hope you enjoy this issue which has many exciting new articles. Please write to me by email with your views, experiences in growing ascleps, ideas for the future of your society and any help you might give. What sort of articles do you want to see for example? Don't just leave me to decide everything! We plan to hold another IAS meeting at ELK in Blankenberge 11-13th September this year and members are encouraged to attend. Further details will be announced later.

Highlights from Tanzania

Wiebe Bosma
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All photos by the author

Introduction

In November 2019 I have been to Tanzania for 3 weeks. The main purpose for this trip was to see a selection of succulents in their natural habitat. With so much interesting wildlife to see we also spent some time on visiting a selection of national parks. This article will be a brief report on this amazing trip.

Tanzania, a general introduction

Tanzania is a republic in eastern Africa founded in 1964 by the merging of Tanganyika and the Zanzibar Archipelago. Since 1996 its official capital city has been Dodoma where the president's office, the National Assembly, and some government ministries are located. Dar es Salaam, the former capital, retains most government offices and is the country's largest city, principal port, and leading commercial centre. The population of Tanzania is growing fast: from ca. 51 million in 2014 up to an estimated population ca. 60 million in 2020, ranking 24th in the world. With 947,300 square kilometers of land, Tanzania is the 23rd largest country in the world and the 13th largest in Africa.

Fig. 1 - Route traveled in 3 weeks time.

Fig. 2 - One of the chameleons from Amani Nature reserve: *Kinyongia tenuis* (Usambara soft-horned Chameleon).

Tanzania, geography and climate

Due to its huge size Tanzania has a very diverse geography including mountian ranges, active and dormant vulcanoes, deep valleys (including the Great Rift Valley), salt lakes, sweet water lakes, plateau's, mangroves, etc.

Tanzania has a tropical climate with regional variations due to topography. Temperatures range between

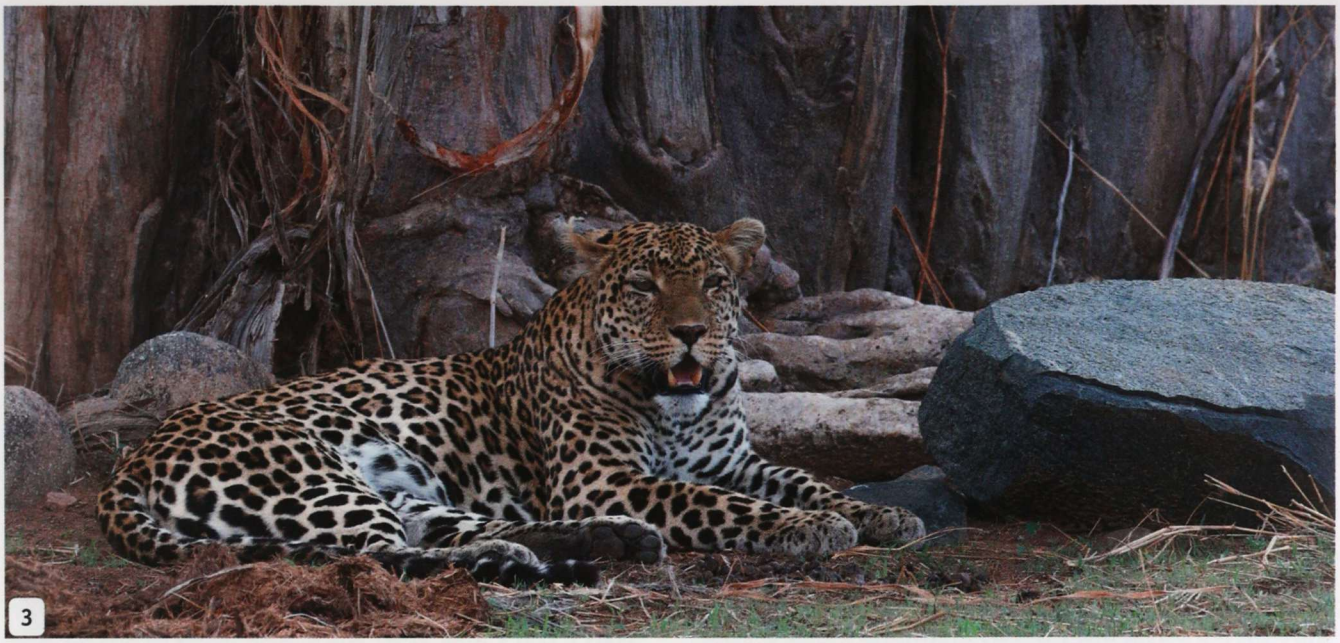

Fig 3 - Preparing for the hunt this leopard in front of a baobab (*Adansonia digitata*) in Ruaha National Park.

season and altitude with the hottest period between November and February and the coldest period between May and August. (15–20 °C). The north and east of Tanzania experience two distinct wet periods – the short rains in October to December and the long rains from March to May. The southern, western and central parts of the country experience one wet season from October through to April or May.

Our trip

This report is on a trip made in 2019 from 2nd – 22nd of November. The first two weeks I travelled with my Italian friend Roberto Ariu, the last week I was on my own. We had booked our car/criver in advance but had not made any reservations for accommodations; because it was low season and we did not stay inside any of the national parks accomodation this never turned out to be a problem.

After arrival at Dar es Salaam we travelled counter clockwise to the north and central part of Tanzania. In 3 weeks time the total distance covered was ca. 4.100 km (fig. 1).

Flora and fauna of Tanzania

Due to its size, diverse geography and climate, Tanzania is highly biodiverse and contains a wide variety of habitats. Six out of 25 globally recognised biodiversity hotspots are found in Tanzania. Ca. 40 percent of Tanzania's land area is set aside in protected areas for conservation. Tanzania has 16 national parks plus a variety of game and forest reserves.

Safari's in Tanzania

With a huge number of mammals, birds and other wildlife, Tanzania is considered to be Africa's ultimate safari destination. Even though our focus was on succulent plants, in 3 weeks time I've visited 5 protected areas for wildlife: Amani Nature reserve (for chameleons and amphibians, fig 2), Arusha National Park, Ngorogoro Crater, Ruaha National Park (fig 3) and Mikumi National Park.

Flora of Tanzania

Tanzania is among the group of African countries with the highest levels of biodiversity, with an estimated 11.000 species of vascular plants. Tanzania is not only a region with a high level of species richness, but also a center of floral endemism, with approximately 1.200 higher plant species so far reported to occur exclusively in Tanzania.

Succulents of Tanzania

There is a great diversity of succulents growing in Tanzania. Some grow only in Tanzania (endemic species) and others can be found in surrounding countries too. Succulents in Tanzania are from different families. Families with the largest number of succulents in Tanzania are Euphorbiaceae (e.g. Euphorbia) , Aloaceae (e.g. Aloe) and Apocynaceae (e.g. Orbea, Caralluma and Ceropegia). Smaller number of succulents are e.g. from the Crassulaceae (e.g. Kalanchoe) and Vitaceae (e.g. Cissus).

Euphorbiaceae

Carter & Smith (1988) list almost 160 species of Euphorbia (succulent and non-succulent species) in Tropical East Africa (Uganda, Kenya and Tanzania). Since than new species have been described and e.g. the genus Monadenium has been included into Euphorbia. These numbers give a good indication of the wealth of euphorbia's in this region.

We've seen quite a few Euphorbia's on out trip; from very small plants till trees up to 10 meters tall. One of the species we have seen is *Euphorbia furcata* (fig 4). This is a small species growing in the protection of bushes. Stems are up to 15 cm long and they have , as the species name already indicates, forked spines. It has a limited distribution range in the southeastern part of Kenya and the adjacent northeastern part of Tanzania.

Fig 4 - *Euphorbia furcata*, between Arusha and Longido.
Fig 5 - Author with *Aloe secundiflora*, between Arusha and Longido (picture by Roberto Ariu).

Fig 6. *Caralluma speciosa*, west of Makuyuni.

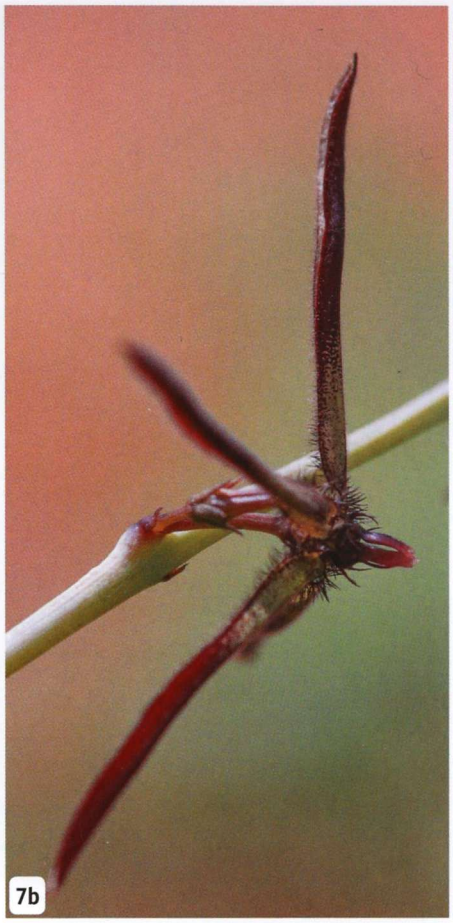

Fig 7 - *Caralluma arachnoidea*, north of Lembeni.

Aloaceae

There may be around 100 species of Aloe in Tropical East Africa (Uganda, Kenya and Tanzania). The species that can be found in Tanzania vary from grass-aloes, stemless rosettes till treelike plants with stems up to almost 10 meters tall. *Aloe secundiflora* (fig 5) is a species with a large distribution area (Tanzania, Kenya, Ethiopia, Sudan, Rwanda). It is stemless and (in general) solitary, leaves are up to 75 cm long and it has a branched inflorescence.

Apocynaceae

Well known members of this family include *Adenium*, Stapeliads (e.g. *Orbea*, *Huernia*, *Echidnopsis* and *Caralluma*), *Ceropegia* and *Brachystelma*. Though Bruyns et al (2017) proposed a new classification in which Brachystelma and all genera of the stapeliads are placed in a greatly enlarged *Ceropegia*, in this article I follow a more conservative approach considering nomenclature.

Caralluma/Desmidorchis speciosa

This is a widespread species naturally occuring in Somalia (type), Uganda, Kenya, Tanzania, Sudan, South Sudan and Ethiopia. Due to its large distribution are these is some variation within this species which has led to the description of new species, now all considered synonymous. ! In habitat it forms huge clumps (up to 1,5 m diameter or even more) and max. circa 40 cm high. We have found this species on several localities and were lucky to find it in flower; though the flowers have a strong, bad smell, the colours are beautiful

Caralluma/Spatulopetalum arachnoidea

This species can be found in Uganda (type), Kenya, Ethiopia and Tanzania. It grows often more or less protected in shrubs. Characteristic for this group of plants is the long flower bearing apical part of the stems which dies back after flowering. From this group of plants we also found *Caralluma turneri* and *C. priogonium.*

Echidnopsis repens

There are only two species of *Echidnopsis* native to Tanzania; *Echidnopsis repens* and *Echidnopsis leachii*. *E. leachii* is a Tanzanian endemic but despite a search at two localities I was not able to find that one. *E.*

Fig 8 - *Echidnopsis repens*, between Arusha and Longido.

repens is from Tanzania (type) and can also be found in southern Kenya. It grows in a shaded position.

Edithcolea grandis

Another widespread species! It can be found in Somalia (type), Yemen (Socotra), Uganda, Kenya, Tanzania and Ethiopia. It is a very variable species. From a more 'splitting'- approach this species should be seperated into several species of their own. Flowers from this species are quite spectacular but unfortunate we did not see any flowers on our trip. This species turned out to be one of the more abundant species though finding it may prove a little bit difficult because in general it grows under full protection of other plants.

Huernia tanganyikensis

This species has been described (1941) as *Duvalia tanganyikensis* but it has been transferred to *Huernia* in 1969. As the species name already indicates its type locality is in Tanzania. Though it has been found in Kenya in recent years, it had not been found in Tanzania for a long time. We found it further to the west compared to localities known from literature. It grew on a more exposed spot than we had expected from literature.

Orbea dummeri

We did find quite a few Orbeas but just one species in flower: *Orbea dummeri*. *O. dummeri* is another widespread species which is known from Uganda, Kenya, Tanzania, Congo and Burundi. Despite its large distribution area it seems to be quite uniform in appearance. Because in general you need flowers

Fig 9 - *Edithcolea grandis*, northwest of Mazinde. Fig 10 *Huernia tanganyikensis*, west of Karatu

to be sure about the indentity of a lot of species we are not fully sure about their identity but we think we also have seen *O. semota*, *O. schweinfurthii* and *O. denboefii*. Time will tell!

Ceropegia nilotica

There are more than 50 *Ceropegia* species known from tropical East-Africa. Whereas some species have more succulent stems to survive dry periods, the above ground parts of other species are not very succulent. These species may die back during the dry season and regrowth may take place from surviving tuberous or fusiform roots.

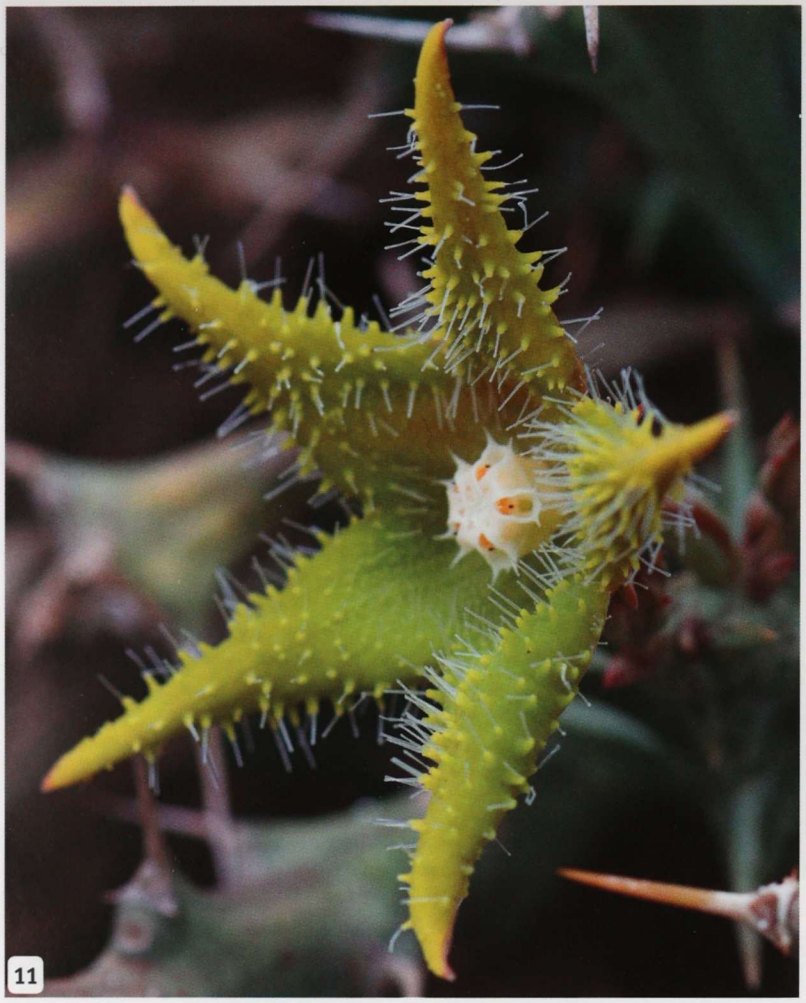

Fig 11 - *Orbea dummeri*, northeast of Makuyuni. Fig 12 - *Ceropegia nilotica*, east of Mwanga.
Fig 13 - *Adenium obesum* (s.l.), northeast of Kifaru.

Ceropegia nilotica is a very widespread species occuring in large parts of tropical and subtropical Africa including South Sudan (type), Ghana, Angola, Zimbabwe, South Africa, Kenya and Tanzania. There are many morphological and colour forms that in the past have been described at species or subspecies level. It has slightly swollen roots and quite succulent stems (ca. 4 mm diameter).

Adenium obesum

There is quite some discussion about the number of *Adenium* species in this region. Omino (2002) mentions just one species for Tanzania and lists *A. somalense* as a synonym for *A. obesum*. Dimmit et al (2009) state that all of the taxa in the range from eastern to western Africa (*A. obesum*, *A. somalense*, *A crispum* and A spec somalense nova) are highly variable from one locality to another and might be considered to be all varieties of one variable species.

We found *Adenium* on rocky slopes in the north/northeastern part of Tanzania and in the 'central part' between Mikumi and Mbuyuni. *Adenium obesum* is poisonous to livestock. It is used as an arrow poison and fish poison and as a pesticide against cattle lice and ticks.

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A new *Boucerosia* from Odisha state eastern India

Frandsen, R.M.I.* & Aditya, S. **
All photos by the author

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Abstract

A new *Boucerosia* species [Apocynaceae] from Odisha State, East Coast of India is described and its relationship discussed.

Boucerosia penduliflora Frandsen & Aditya, sp. nov.
Boucerosia umbellata (Haw.) Wight & Arn. affinis

Type Locality: Nilagiri Hills, Balasore District Coastal Odisha State, India. Average altitude 200m. Soumen Aditya, SA30- 099 M. Holotype: PRE.

Introduction

In a visit to Odisha State, which I (the co-author, Soumen Aditya) had visited several times before, I discovered a new *Caralluma* species which I described as *C. moorei*. On the beautiful and succulent plant-rich Nilagiri Hills, near the Kuldiha Wildlife Sanctuary I found another, as yet undescribed, *Boucerosia* from the Umbellata Group growing close to the new *C. moorei* locality. The plant was not in flower and its stem was very similar to those of *B. umbellata,* but differing in being very cryptic with lax branches. In a further visit in August 2014, which is when I found the plants in flower, on investigation I found that important characteristics of the plant differed markedly from the other Indian *Umbellata* Group plant species.

Plants of the genus *Boucerosia* were previously included in the genus *Caralluma*. In 1995, Darrel Plowes published a return of these umbellate plants to their original published genus – *Boucerosia*.

Boucerosia penduliflora grows on the lower slopes of the Nilagiri Hills in association with *Sanseveria sp, Caralluma moorei, Gloriosa superba. Kalanchoe pinnata, Jatropha glandulifera, Phoenix* sp, and many fern species, evergreen grasses and thorny plants, mostly in open rocky grassland, Notwithstanding extensive searching I could not find the plant growing above the lower slopes of the hills.

This part of southern India is hot to humid and

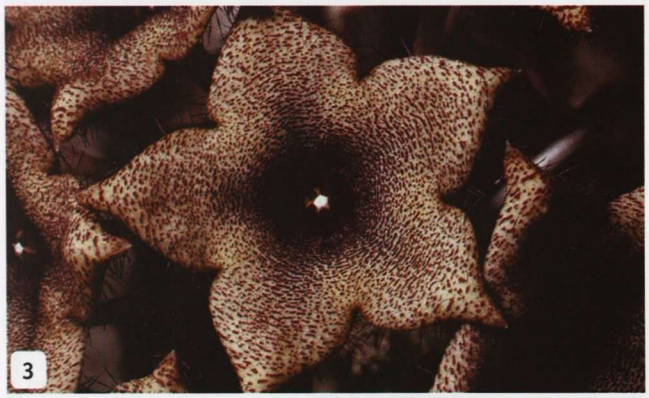

Fig. 1 - *Boucerosia penduliflora* in the type habitat showing the pendant nature of the flowers. Fig. 2 - In cultivation clearly showing the open flower and the vestigial leaves. Fig. 3 - *Boucerosia umbellata* – a colour variation of this robust species.

is cool in the early mornings. The type locality of *B. penduliflora* is situated about 8 km west from Balasore near to Nilagiri Village in hilly country. Unfortunately, due to agricultural activity, cattle grazing, tourist activity, population pressure and other factors, many plant species of the area are under threat.

B. penduliflora it is not large, many-branched or many flowered as is *B. umbellata*. The flowers also have a shallow corolla tube, it has few lax short stems with very attractive but few pendulous flowers. In the many plants I studied in the area, I found that they do not form large clumps and the growth habit differs from that of *C. moorei*. This species occurs mostly under large boulders and is well hidden, whereas *B. penduliflora* occurs mostly in open lands under spiny bushes or in rock crevices and with evergreen grasses. Here I found many clones of *B. penduliflora*, growing in the same area as *C. moorei*. I subsequently made a few more short trips for more detailed study of the habitat. For some time after studying the plant in cultivation it was revealed that the clones in flower have no indication of any marked variation in their general morphology.

It was not until 2018, when I discussed with my friend Mr Robin Frandsen from South Africa, he

Boucerosia umbellata showing the large clustering nature of the umbel of this robust and large species.

confirmed my opinion that, due to its marked differences from its nearest relative, *B. umbellata* and indeed from the other Indian umbellate species, it was without doubt a new species. Our discussions led to an agreement that we should describe this unique plant as the new species, *B. penduliflora,* which we have named for the pendant flowers.

Description

Plant: Succulent herb, not profusely branched at base, low semi erect, and low clumps. **Stems**: prostrate, low erect, fleshy, glabrous, light green in the rainy season, other time grayish-purplish. Four angled, apex erect, but occasionally pendant. Usual height 15- 25 mm. internodes spacing about 10-15 mm, 0.8- 15 mm wide angle, node sharply quadrangular. Mature stem woody appearance, sap watery and sticky with a bitter taste. **Leaves**: deciduous, scale-like, minute, lanceolate- deltoid, glabrous, light green, about 2.0mm long and 0.4 mm broad near base, apex acute. **Flowers**: apical, pendulate on umbellate cymes, 9-12 per umbel. **Pedicel**: cylindrical, about 11- 12 mm long and 2.0mm thickened, bent downward before the buds open, glabrous, purplish coloration. **Calyx**: lanceolate, minute, five lobed, divided to the base, 1.5mm long and 1.0 mm broad at base, apex acute, purplish. **Corolla**: cylindrical/campanulate, tubular base, bell-shaped, corolla tube 12 mm long and 0.5- 12 mm broad. outside glabrous, whitish-purplish, finely purple speckled, corolla limb five lobed, lanceolate, margin ciliate with few spindle-shaped, vibratile cilia near the apical portion; tube and limb whitish-pink heavily streaked with lateral irregular purple striae with the tips of the lobes solid purple. **Corona**: staminal, biseriate, 2.0 mm across, outer five lobes formed two erect biseriate segments, inner lobes broadly attached to the base of outer corona, linear lanceolate five-biseriate lobed, slightly curved, no overlapping, incumbent on anther lobes, colour very dark purple, **Stamens**: five, 1.0mm long, **Pollinia**: five, yellow, Pollen masses solitary in each anther cell, yellow, very waxy attached by brown

Fig. 1 - *Caralluma pauciflora.* Fig. 2 - *Caralluma moorei* – a species sharing the habitat of *Boucerosia penduliflora*

caudicles, **Gynostegium** 1.0 mm long. **Follicles**: paired, horn like.

The only other umbellate Indian *Boucerosia* to be found in Odisha State is *B. umbellata*. This very widespread species is used here as a comparison species as it is closest in morphology to *B. penduliflora* than to any other of the Indian umbellate plants. The differences are marked: *B. umbellata* is a more robust, larger, species with more sub-erect stems producing large umbels of many erect to sub-erect flowers. The umbels of *B. penduliflora* are sparser with pendant flowers. The corollae of *B. umbellata* are shallowly campanulate, almost flattened, whereas the corollae of *B. penduliflora* are deeply cupped. The inner corolla faces of *B. umbellata* are finely striated with many purple irregular lines and the lobe margins are fringed with short, simple white hairs, whereas *B. penduliflora* has coarser and far fewer striae and the lobes are fringed with longer, spindle-shaped vibratile cilia. Flowering time: July- October. Fruiting: December

Habitat: occurs on exposed grassland, under rock cracks, found on lower slopes, sometime with grasses and shrubs, soil, stony, gravelly alluvial.

Distribution

Balasore District, Odisha State, Lower slopes of the Nilagiri Hills

Conclusion

The umbellate species of the Indian *Boucerosia* complex is not yet fully understood. It is the intention of Mr Adiya to continue in his quest to further document and examine this fascinating group. Further study is desirable to fully understand the other members of the Boucerosia or umbel-forming species, such as *B. pauciflora, B. indica, B. diffusa, B. umbellata, B. lasiantha* and *B. procumbens*. This new species represents the opening episode in this quest.

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Stapelia engleriana the "iceberg" species from southern Africa

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Currently *Stapelia* is viewed as a genus of 28 species from southern Africa. It is found south of S. Angola, S. Zambia and central Mozambique but has its greatest diversity especially in Namibia and South Africa and also in Botswana and Zimbabwe (Bruyns, 2005). Some species such as *Stapelia gigantea, S. grandiflora* and *S. hirsuta* have quite widespread distribution patterns. In contrast other species are very localised, the most extreme example being *S. remota* that is apparently only known from a single locality in the Baynes Mountains of Namibia. (However, this may be a hybrid of uncertain origin, since despite efforts it has not been recollected.)

The characteristics of *Stapelia* include succulent stems that are usually erect, 4-angled, finely pubescent or more rarely almost glabrous. Flowers of stapelias are extremely variable in size, ranging from those of *S. similis* that are a mere 2 cm diameter, to the goliath of the genus, *S. gigantea*, in which some clones have flowers with the colossal diameter of 40 cm, making these amongst the largest flowers of all flowering plants on the planet! Flower surface texturing is also widely variable: some are very hairy (e.g. *S. hirsuta*) whereas others are smooth and shiny (e.g. *S. schinzii* var. *bergeriana*).

Generalities aside, the species showcased here, *S. engleriana*, has several unique features. This species was first described in 1905 by the German collector Rudolf Schlechter (1872–1925) based on a living plant he found at the Botanical Garden and Museum, Dahlem, Berlin (Bruyns, 2005). He dedicated it to Adolf Engler, the then Director. Although Schlechter travelled widely in South Africa he never actually collected this species himself (Gunn & Codd, 1981).

Fig. 1 - *Stapelia engleriana* in a 35 cm diameter pan photographed in 2008. Photo: Colin Walker

However, according to White & Sloane (1937) this species appears to have been collected as early as 1841. Since its first description in 1905 the species has been widely collected and is now known to be quite widespread in the dry parts of SW Karoo in the Western Cape Province of South Africa but is of more regular occurrence in the Great Karoo. Bruyns (2005) says that "plants usually grow on stony shale or tillite slopes under stones or small bushes, often sheltering under or growing socially with shrubs of *Rhigozum obovatum*" (Bignoniaceae).

Stapelia engleriana is a most distinctive species that can be reliably identified even when not in flower, a feature that does not apply to many species of this diverse genus. The stems are fairly thick and 4-angled in cross section with short tubercles but what makes the plant unique is that these stems are prostrate to rhizomatous, a feature found in only one other southern African stapeliad, namely *Stapeliopsis saxatilis* (Bruyns, 2005). This feature is why I've titled this article the "iceberg"

Fig. 2 - Flower of *Stapelia engleriana* about 2 cm in diameter. Photo: Tina Wardhaugh.
Fig. 3 - *Stapelia engleriana* in a 13 cm diameter pot in fruit in 2004. Photo: Colin Walker.

stapelia, i.e. the majority of the plant is hidden below the surface of the ground! This rhizomatous habit is rare but does occur in other stapeliads, for example in the Macaronesian *Apteranthes burchardii*. My plant of *S. engleriana* (Figure 1) reached its maximum size in a 35 cm diameter pan. When this was depotted the pan was nearly filled with underground rhizomatous stems up to 30 cm long and 22 mm across, shortly pubescent and grey-green in colour with some reddish mottling especially when grown in full sun.

The plant reached its peak of perfection in time for the BCSS National Show in 2012 when in full flower (Figure 1), it achieved the accolade of a second prize in the unrestricted pot-sized class for a member of the "*Stapelia* group". Individual flowers are unusual and indeed unique for a stapelia since these are small, about 2 cm diameter (Figure 2), are produced on a stalk up to 2 cm long, whilst the flowers themselves point downwards, have a shallow tube with the corolla lobes folded back, making the flowers somewhat button-like. In contrast most stapelia flowers are wide open with the lobes pointing outwards. This unusual flower presentation mode begs the question: what pollinates these flowers and how is this achieved? As yet there are no answers to these questions in the literature. Surface texturing to the flowers is of longitudinal raised veins, dark purple-brown in colour, slightly shiny and glabrous (free from hairs) except along the lobe edges.

Regardless of the pollination mechanism I achieved successful fruit production in 2004 (Figure 3). My plant was then in a 13 cm diameter hanging pot and produced 5 paired fruits in an open greenhouse with no intervention from me. Each of the paired follicles was up to about 12 cm long, pale lilac in colour with darker mottling. I didn't collect the seed so I can say nothing about the seed viability or germination. This turned out to be a one off event since my plant never produced any other fruit in subsequent years. Sadly after achieving crowning glory at the show the plant went into decline and suffered a mealy bug attack from which it never recovered. Currently (2018) I am starting the plant again with a new rooted cutting.

The uniqueness of this species has never been questioned. It has, however, suffered just one taxonomic change: Leach (1982, 1984) reinstated the genus *Tromotriche* Haw. and this species became *T. engleriana* (Schlechter) Leach together with just two other species. This move was relatively short-lived since Bruyns (1995) expanded *Tromotriche* to 11 species, later reduced to 9 species (Bruyns, 2005), but returned *T. engleriana* to *Stapelia*.

Stapelia engleriana is truly a unique species and in my experience is easy to grow, flower and even occasionally fruit. What it lacks in flower size compared with, for example, *S. gigantea*, it makes up for in interest especially through its "iceberg" growth habit.

Acknowledgement

I thank Tina Wardhaugh for use of her close up photo of the flower.

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Asklepios 126/2020

Ceropegia seminuda comb. nov. (Apocynaceae = Asclepiadaceae) and notes on other sect. *Duvalia* species of *Ceropegia* in Yemen

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Abstract

The new combination *Ceropegia seminuda* (Bruyns) **Othman Al-Hawshabi & Abdul-Ghani** is proposed to replace *Ceropegia sulcata* subsp. *seminuda* (Lavranos) Bruyns. This elevation to the rank of a species is justified because of its distinctive floral characters from *C. sulcata* (N. E. Br.) Bruyns. These two taxa, *C. sulcata* and *C. seminuda*, are recorded growing under the same bushes at Toor Al-Baha district, Lahej Province, Southern Yemen, in at least two localities: under of Salsola spinescens in Jabal Al-Gash, on altitude 940 m a.s.l. and in Wadi Ma'adin, on altitude 502 m a.s.l., under of Lycium shawii. Each taxon has its own distinctive characters. Intermediates were never recorded between them. A detailed tabulated description and an illustration of *C. seminuda* and *C. sulcata*, with key to four species of subsect. Arabicae of *Ceropegia* in Yemen are given. *Ceropegia. somalilandica* Bruyns is discussed. Also in this paper some names are referred to the level of synonyms.

Key words: Apocynaceae, *Ceropegia*, *Duvalia*, new combination, synonyms, Yemen.

Introduction

In 1812, the genus *Duvalia* was established by the English botanist Adrian Hardy Haworth (1768-1833). It was named in honour for the French botanist Henri Auguste Duval (1777-1814). In this dedication, Haworth was actually returning a compliment paid to him in 1809, when Duval had named, in honour for Haworth, the genus *Haworthia* Duval. *Duvalia* species of Yemen belong to sect. *Arabica* Meve & F. Albers. Stems are globose, cylindrical to club-shaped, obscurely 4-angled, greyish-green, irregularly mottled with purplish marking, tubercles (podaria) subulate without clearly separated leaf

Fig. 1 - *Ceropegia seminuda*; A: budding and flowering stem; B: annulus with pollination apparatus in top view.

rudiments, stipules absent. Inner corona lobes whitish, with an erect, acute and slightly incurved dorsal part (**Meve 1997**). An outer disk-shaped corona and a stipitate gynostegium are distinct floral characters for *Duvalia* species from those of other stapeliads (**White & Sloane 1937, Albers & Meve 2002**).

Recently, 16 spp. of *Duvalia* have been referred to Ceropegia section Duvalia, in two subsections; subsect. *Arabicae* (Meve & F. Albers) Bruyns, including 6 spp., distributed in North-east Africa and southern Arabian Peninsula, while subsect. *Stipulatae* Bruyns which includes 10 spp., are distributed from South Africa to Malawi (**Bruyns *et al.* 2017**).

Characters		Species		
		C. seminuda	*C. somalilandica**	*C. sulcata*
Stem	Length Width	4-6 cm 1-1.2 cm	3-5 cm 1-1.5 cm	4-8 cm 1-1.5 cm
Flower Pedicels	Length Thick	2.5-3.5 cm c. 2 mm	2.5-3.5 cm c. 2 mm	2-2.8 cm 1.5-2 mm
Sepals	Length Width	c. 7 mm 1.8-2 mm	c. 3 mm 2 mm	4-5 mm 1.5-2 mm
Corolla	Diam.	c. 35 mm	30-35 mm	30-37 mm
Lobes	Length width	c. 14 mm 8-10 mm	c. 15 mm 6.5-7.5 mm	c. 18 mm 7-10 mm
Annulus	Diam. High	Glabrous 9-12 mm c. 4 mm	Glabrous 10-11 mm 2-3 mm	Densely hairs (5-8 mm long) 12-14 mm 3 mm
Coronal disc	Diam.	c. 7 mm	6.5-7.5 mm	6.5-7 mm
Follicles	Length Diam.	c. 9 cm c. 8 mm	- -	12-16 cm 7-8 mm
Seeds	Length Width Wing broad Coma long	- - - -	- - - -	c. 6 mm 3-4 mm 1 mm c. 20 mm
	Chromosome number*	2n=22 or 2n=44	2n=22	2n=44

Table 1. Summary of the morphological characters and chromosome counts of the three species of *Ceropegia*, sect. Duvalia
* Information about chromosome number and *Ceropegia somalilandica* modified from **Meve (1997)**.

Taxonomic treatment

Key to *Ceropegia* species of subsect. Arabicae, sect. Duvalia in Yemen

1. Annulus thin 2 mm high, densely covered with hairs, 5-8 mm long, corolla lobes glabrous, lamina with 5 longitudinal furrows ..... *C. sulcata*
- Annulus fleshy, above 2 mm in height, glabrous or nearly so, lamina without, or with 3 or 5 furrows 2
2. Corolla lobe margins with clavate hairs, 2-3 mm long ..... *C. seminuda*
- Corolla lobe margins without clavate hairs..... 3
3. Annulus glabrous, merging into the velvety haired corolla lobes..... *C. velutina*
- Annulus occasionally papillate, otherwise corolla glabrous, brilliant ..... *C. somalilandica*

Ceropegia seminuda (Bruyns) Othman Al-Hawshabi & Abdul-Ghani comb. nov. (Figs. 1 & 3).

Basionym: Ceropegia sulcata N. E. Br. (Bruyns) subsp. seminuda (Lavranos) Bruyns, South African Journal of Botany 112 (2017), comb. et stat. nov.

Duvalia sulcata N. E. Br. var. seminuda Lavranos, Cact. Succ. J. (US) 39(1): 5 (1967); Type: (S) Yemen, Subaihi Country (Rauh & Lavranos, 1967: 3157; holotype K).

Duvalia sulcata N. E. Br. subsp. seminuda (Lavranos) Meve (Pl. Syst. Evol., Suppl. 10: 116. 1997), stat. nov.

Description

Stems ascending, rounded, bluntly quadrangular (4-angled), 4-6 cm long, 1-1.2 cm wide, glabrous, greyish-green with dark green spots, with prominent spreading fleshy teeth 6-8 mm long. Flowers 1-3 together from near the base of the stem, borne on pedicels; pedicels 2.5-3.5 cm long and c. 2 mm thick, glabrous, spreading horizontally. Sepals c.7 mm long, 1.8-2 mm wide at the base, lanceolate acute, glabrous. Corolla c. 35 mm diam., ochre, pale maroon, reddish or dark brown; lobes triangular, c. 14 mm long, 8-10 mm wide, lamina flat to convex with slightly recurved margins, with 5 longitudinal furrows on the upper surface, apex finely papillate, margins basally with 1.5-2.5 mm long, vibratile clavate purple hairs. Annulus circular or pentagonal, 9-12 mm diam., c. 3.5 mm high, massive glabrous. Coronal disc c. 7 mm diam.,

Fig. 2. *Ceropegia sulcata*; A: budding and flowering stem; B & C: flowers in top view showing of annulus densely covered with hairs and pollination apparatus.

circular pentagonal smooth, contained within the annulus, with reddish-brown dots near the margin and purplish whole rings, glabrous. Staminal corona lobes 2.2-4 mm high, 1.4-2.2 mm wide, erect, ovoid, acute, slightly curved inwards at the apex, white or cream. Pollinia dark yellow. Follicles c. 9 cm long, c. 8 mm diam., grey green with reddish marking.

Distribution: (N & S) Yemen and Saudi Arabia (Albers &Meve 2002).

Habitat: On sandy or rocky soil, mostly in Acacia tortilis-Lycium shawii- Euphorbia qarad- Salsola spinescens dominated shrubland.

Specimens examined: **Yemen, Lahej governorate, Toor Al-Baha district (Subaihi Country), Wadi Ma'adin, 498 m a. s. l.,** 13° 06' 654" N, 44° 21' 209" E, 24. 5. 2009, Othman 0690; **Al-Maamiah village near track to the capital of district, 539 m a. s. l.,** 13° 07' 628" N, 44° 19' 983" E, 6. 7. 2009, Othman 1082;Wadi Mabaq, 642 m a. s. l., 13° 10' 258" N, 44° 17' 992" E, 29. 7. 2009, Othman 1295; Hijet Ma'afa (Al-Himah) 761 m a. s. l., 13° 12' 096" N, 44° 17' 717" E, 29. 7. 2009, Othman 1356; Jabal Al-Gash, 940 m a. s. l., 13° 12' 084" N, 44° 20' 079" E, 15. 4. 2009, Othman 3000;Nofakha, 649 m a. s. l., 13° 11' 147" N, 44° 20' 818" E, 3. 1. 2010, Othman 3594;**Wadi Ma'adin, 502 m a. s. l.,** 13° 06' 564" N, 44° 21' 242" E, 2. 10. 2010, Othman 4637; Al-Baqamah, 679 m a. s. l., 13° 11' 061" N, 44° 19' 283" E, 5. 10. 2010, Othman 4646; Jabal Assaqmi, 997 m a. s. l., 13° 11' 967" N, 44° 26' 080" E, 1. 11. 2010, Othman 4914; Wadi Ma'adin, 515 m a. s. l., 13° 06' 569" N, 44° 21' 314" E, 18. 11. 2015, Othman 5223.

Ceropegia sulcata (N. E. Br.) Bruyns, South African Journal of Botany 112 (2017). (Fig. 2 & 3).

Duvalia sulcata N. E. Br. in Bull. Misc. Inform., Kew 1910: 193 (1910). Type: (S) Yemen, probably from the Hadhramout, 1896/97, Bent s.n. (holotype K).

Description

Stems ascending, rounded, bluntly quadrangular (4-angled), 4-8 cm long, 1-1.5 cm wide, glabrous, greyish-green with dark green spots, with prominent spreading fleshy teeth 6-10 mm long. Flowers 1-3 together from near the base of the stem, borne on pedicels; pedicels 2 -2.8 cm long and 1.5-2 mm thick, glabrous, spreading horizontally. Sepals 4-5 mm long, 1.5-2 mm wide at the base, lanceolate acute, glabrous. Corolla 30-37 mm diam., (greenish-) ochre, pale maroon, reddish-brown or pale chestnut-brown, shiny; lobes triangular, c. 18 mm long, 7-10 mm wide, lamina flat to convex with slightly recurved margins, with 5 longitudinal furrows on the upper surface, apex finely papillate, margins basally with 1.5-2.5 mm long, vibratile clavates purple hairs. Annulus circular weak, 1.2-1.4 cm in diam., 3(-4) mm high, densely covered with hairs, 5-8 mm long, simple, straight, whitish or pinkish. Coronal disc 6.5-7 mm diam., round 5-an-

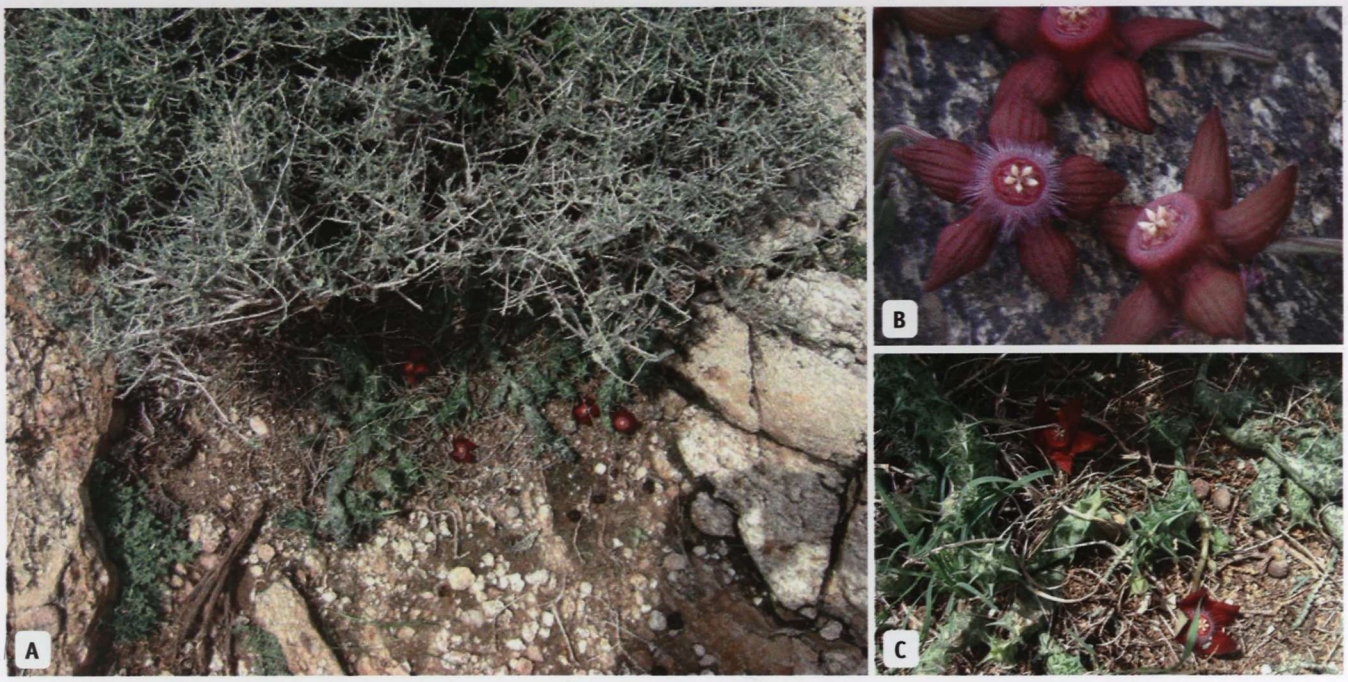

Fig. 3. A – C *Ceropegia sulcata* and *Ceropegia seminuda* are growing under the same bush of *Salsola spinescens* on altitude 940 m a.s.l.

gled, smooth, contained within the annulus, with reddish-brown dots near the margin and whole rings, glabrous. Staminal corona lobes 2.2-4 mm high, 1.4-2.2 mm wide, erect, ovoid, acute, slightly curved inwards at the apex, white or cream. Pollinia dark yellow. Follicles 12-16 cm long, 7-8 mm diam., grey-green with reddish markings. Seeds c. 6 mm long, 3-4 mm wide, grey-brown, wing c. 1mm broad, coma c. 20 mm long.

Distribution: (S) Yemen and Saudi Arabia (Chaudhary 2001, Albers & Meve 2002). Plants of Sudan are different from typical C. sulcata, we think plants of Sudan should be described as a distinct species.

Habitat: On sandy or rocky soil, mostly in Acacia tortilis-Lycium shawii- Salsola spinescens dominated shrubland.

Specimens examined: Yemen, Lahej governorate, Toor Al-Baha district (Subaihi Country), Wadi Ma'adin, 498 m a. s. l., 13° 06' 654" N, 44° 21' 209" E, 24. 5. 2009, Othman 0673;Jabal Al-Gash, 940 m a. s. l., 13° 12' 084" N, 44° 20' 079" E, 15. 4. 2009, Othman 3004;**Wadi Ma'adin, 502 m a. s. l.,** 13° 06' 564" N, 44° 21' 242" E, 2. 10. 2010, Othman 4636; Wadi Ma'adin, 516 m a. s. l., 13° 06' 667" N, 44° 21' 292" E, 28. 11. 2015, Othman 5222.

Ceropegia somalilandica Bruyns, South African Journal of Botany 112 (2017).

Duvalia somalensis Lavranos in Cact. Succ. J. (US) 43 (2): 65 (1971). Type: (N) Somalia, between Borama and Zeila, 1968, Lavranos 6838 (holotype FT).

Duvalia sulcata N. E. Br. subsp. *somalensis* (Lavranos) Meve (Pl. Syst. Evol., Suppl. 10: 118, 1997), *comb. et stat. nov.*

The reduction of this taxon to subspecific rank under the Arabian D. sulcata by Meve (1997) seems unjustified and is not accepted (see Lavranos 2006).

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My Favourite plants

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All photos by the author

Nice to meet you all, members of IAS. I'm Kono Tadayoshi from Japan. It is my great honour to show you my collection here as the introduction to my article. I am interested in almost every kind of succulent, *Euphorbia*, *Agave*, *Pachypodium*, Mesembs etc.. Off course I love to grow Asclepiads, I'm fascinated by their curious flowers. It is sometimes difficult to keep them for many years though, because the majority of Asclepiad species are not winter-hardy. However I can't stop collecting new species one after the other.

Here I focus on my specimens of *Asclepiadaceae* and *Apocynaceae* (as its relative) from my greenhouses. These are mainly my favorites and the rarities.

Caralluma socotrana

I have to mention *C. socotrana* first. This is my favorite Asclepiad species. It's also not much in cultivation. Sometimes offered as grafted plants, it's a rarity. If I say *C. solenophora* is the most curious species, *C. socotrana* is the most beautiful one for me. The specimen plant in the picture was grown to nearly 40cm in diameter. It

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Caralluma solenophora

This species is one of the most difficult to find in cultivation. Fortunately, I have kept this plant nearly 10 years. Its stem looks like *C. hexagona*, but once it flowers, it is incomparable with other *Caralluma* species. Such bell- shaped flowers are very distinctive. Looking up from the bottom, we can see the opening of each flower. This species was described by John Lavranos together with *C. hexagona* and *C. deflersiana* as SW Saudi Arabian species. This species was found in the highland, Wadi Salul, Yemen, at 2100m above sea level. So, this species can survive winter without heating in Japan, but I never water during winter, because it is very sensitive (easily rots) to wet soil at low temperatures. It likes to grow at high temperatures over 30 degrees. I only propagate it by cutting. I hope to have another clone to make seeds, but it is still difficult to find another clone though. (Figs. 4 & 5)

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is no longer in my greenhouse, but I can easily remember its beauty. When I bought it, it was 10cm in height with badly damaged branches. I really took great care of the withered plant for years. It likes to grow during summer under very hot condition as we wipe off sweat, and full sun as much as possible. Its flowers looks amazing. I never mind its smell when I see its crimson colour flowers on greenish-white stems. Its flower emit a very strong odour (I like it though), interestingly its body also stinks when we touch it. I don't know any other species like that. I got a lot of seeds from this mother plant, but the lifespan of the seeds was short. It should be sown within 2 years. Its name is derived from Socotra, but actually this is not endemic to Socotra Island. It's also found in Kenya. I heard from Rainer Martin that they appear around Magadi Lake. It seems difficult to visit Socotra Island now, so I really hope to visit Kenyan localities in a few years. (Figs. 2 & 3)

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Ceropegia stapeliiformis crested and monstrose

Ceropegia stapeliformis crested, called 'DRAGON TAIL'. *Ceropegia stapeliiformis* is a very common species that we usually don't much care for in nurseries. But, once it crests, it shows a totally different form seducing people's eyes. It looks like uncontrolled strong waves in a storm or something like a dragon's scales put in a pot. Its body colour is also fantastic. It turns brown-red on the side of sunlight, and deep green on the other side of shade. Newly emerged stems shows colours like iron. You must be fascinated by this plant, when you get your hands on it. Fortunately, this crest is very stable. If a normal stem appears it will crest again after a while.

Another interesting form of *C. stapeliiformis* is labeled as *C. stapeliformis* 'monstrosa'. I first found this at my Czech friend's place. He said it might be a hybrid, but the details are unclear. I saw a flower bud at his place, and it looks like normal *stapeliiformis*. I grew cuttings from him. As you see, its internodes are very short, so its stems don't elongate very well. It keeps compact.

As relatives of Asclepiads, I'm also very addicted to Pachypodiums. *P. namaquanum* and *P. saundersii* from the African mainland, and *P. brevicaule*, *densiflorum*, *eburneum*, *inopinatum*, *leucoxanthum*, *enigmaticum* etc. from Madagascar island. I keep imported specimens as mother plants, and propagate species by seedling. (Figs. 6 & 7)

Pachypodium namaquanum

P. namaquanum is always my favorite. Undulating leaves and tubular flowers make a beautiful crown on the top of the spiny body before the dormant season. In my experience, this species takes at least 15years to be mature

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(flowering) from seed, all other Malagasy species can bloom in a few years from sowing. I grow some flowering mother plants and harvested seeds from them by myself. Now I have a corner of many *namaquanum* seedlings in my greenhouse. I feel delight whenever I see the corner. Lately, I also try to make a hybrid with *P. succulentum* (so-calld 'Aridlands'), but yet to succeed. (Fig. 8)

Pachypodium enigmaticum

For these years, I focus on propagating *P. enigmaticum* by seedling. This species was recently described by my friend Petr Pavelka. It has very big yellow flowers for a pachypodium, over 60mm in diameter. Very attractive yellow flowers. Still scarce in cultivation, only grafted plants are available.

Years ago, I also bought some grafted plants from Petr. As he says, he grafts each seedling they are all different clones. That is good to make seeds. I pollinated successfully and now I have enough seedlings. But it grows slowly like *P. brevicaule*, not like *P. eburneum*. I hope to see flowers of these seedlings in a few years. (Figs. 9 & 10)

Pachypodium brevicaule ssp. *leucoxanthum*

Years ago, I had the opportunity to grow some imported mother plants of *P. brevicaule* ssp. *leucoxanthum*. It is a curious subspecies. In my observation, the flower colour varies from pure white to yellowish white. The flower size is much bigger than *brevicaule*, similar to that of *eburneum*. The flower stalk length is very variable, long like *eburneum* to almost nothing like *brevicaule*. The fruit is much bigger than *brevicaule* and similar to *eburneum*. The body colour is also rather whiter than normal *brevicaule*, but at least, the low shape body looks similar to *brevicaule*. It is described as a subspecies of *brevicaule*, but for me, this species looks more related to *eburneum* than *brevicaule*. This can be self-pollinated, as other Malagasy pachypodiums as well. So, I can propagate the species by itself. Furthermore, for these years, I made strictly controlled pollinated hybrids with normal *brevicaule*. I hope to select low shape plants like *brevicaule* with pure white flowers and very short flower stalk. (Fig. 11)

A Journey to Malpais de Guimar, Tenerife

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All photos by the author

Fig. 1 - *Euphorbia canariensis* with me.

In May 2018, I reserved a flight from Narita to Tenerife via Madrid to see my friend Giuseppe Orlando. It just took 3 hours from Madrid to Tenerife North. Tenerife island is one of the biggest islands of the Canaries and has the largest mountain, Teide (3718m) in Spain.

He picked me up at the airport, and we went to Malpaís de Güímar at the east of Tenerife to see some habitat. On the way to Malpaís, I could see thick plants on the rock cliffs from the car. It looked for me totally different from Japanese scenery.

Now, we started walking at Malpais de Guimar. There was volcanic landscape near the sea. The ground was covered with red lava hurting my leather shoes step by step. At first glance, I could see a lot of huge clusters of *Euphorbia canariensis*. They were nearly 3m in height with very nice shapes. I could find small plants too. They were small, but even looked aged with black- coloured stems at the base. *Euphorbia balsamifera* were also plenty there. Even small plants had very nice shapes with many branches. They looked so healthy with fine coloured stems, densely branched.

Fig. 2 - Large cluster of *Euphorbia resinifera*. Fig. 3 - *Ceropegia fusca* Fig. 4 - Crested node of *C. fusca*.

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After walking some time, Giuseppe showed me the first *Ceropegia fusca*. It looked distinctive, so white, standing there. Once I found one, I could find another one easily.

I couldn't stop feeling an attachment to each *fusca*, as I found one after the other. I walked along *fusca* to *fusca*. Mature plants were under the blue sky, but small plants often grew under shrubs. They looked as white as *Dudleya*, impressive! I grew them in my greenhouse once, but they were more greenish or dark colour, never been such a strong white. Nature is beyond our control, I was overcome in thought.

I live with succulents gathered from all over the world, but this was my first time visiting natural habitat. I just saw a few species there, but I got a special experience feeling something in the air of the habitat.

Thank you Giuseppe!

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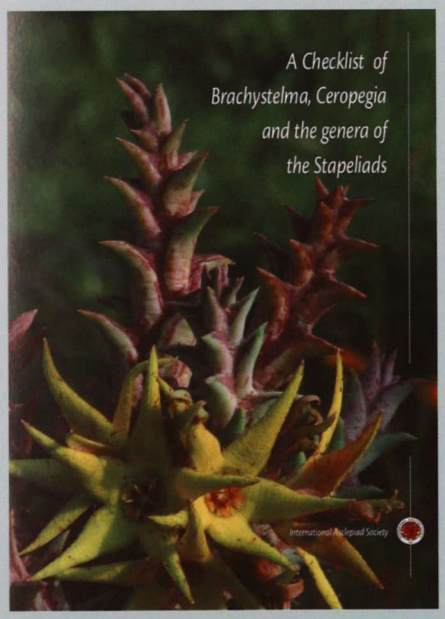

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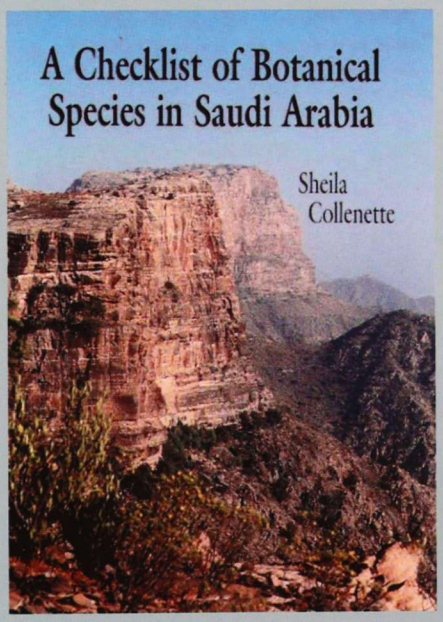

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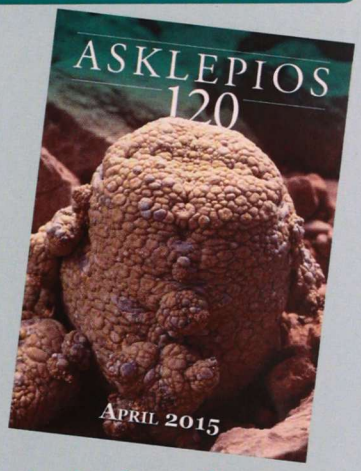

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