SLNHS

No. 21 - 5 pages

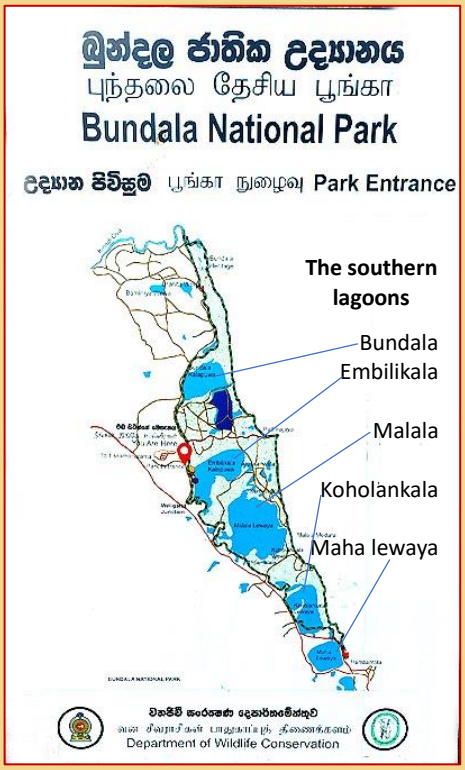
# Natural History Snippets

Brief reports by members based on their observations of nature

## Bundala National Park and its troublesome invasives

A panoramic view of the Bundala lagoon

Embilikala lagoon seen from the Park Visitor Centre




The Bundala National Park is located about 250 km southeast of Colombo in the Hambantota District of the Southern Province. A 2018 table provided by the DWC and quoted in the IUCN, Marine Protected Areas website in 2022 gives the total area as 9,137.98 ha of which 18% (1,706.2 ha) consists of marine and brackish water habitats. The figures are somewhat different in the 2006 IWMI report of the Bundala Wetland Cluster, where the total area of the National Park is given as "3,698.010 ha; of which 1,990 ha are wetlands." [Directory of Marine Protected Areas, WNPS, 2023]

Two alien invasive plants—*Prosopis juliflora* and *Opuntia dilenii*—have been troublesome for many years, but recent efforts to eradicate them from the National Park are showing good results.

***Prosopis juliflora*** (Sw.) DC [mesquite, katu andara], has become an invasive weed in many countries where it has been introduced [1]. It was planted in Hambantota in the 1950s as a shade and erosion control tree [2], dry and arid conditions being its natural habitats in its native Mexico, South America and the Caribbean. It soon invaded the grasslands in and around Hambantota and the Bundala National Park. It can now be seen in the Puttalam area too.

*More correctly referred to as *Neltuma juliflora* (Sw.) Raf., the currently accepted scientific name (Plants of the World online - https://powo.science.kew.org/results?q=Prosopis%20juliflora)

The tree has a deep root system, making it difficult to remove. It propagates through seeds, that can be carried to new locations by animals. The seeds are edible by humans too and said to be nutritious. The ability of the plant to regenerate from remnant roots following the removal of the trunk and arial parts makes eradication difficult.

In the Bundala NP its spread has been at the expense of the pre-existing natural flora. Eradication programmes have shown that physical removal of mature trees should be followed up by removal of emerging plants and replanting with native flora [3, 4, 5].

1. https://en.wikipedia.org/wiki/Neltuma_juliflora
2. Lalith Gunasekera, *Invasive Plants: A guide to the identification of the most invasive plants of Sri Lanka*, Colombo 2009, pp. 101-102.
3. Channa Suraweera, Assistant Director, Southern Region, Department of Wildlife Conservation, pers. comm.
4. Edirisinghe, E.A.S.R., Ranaweera, B. and Suraweera, P.A.C.N.B., 2018. *Evaluation of Uprooting Method to Control Prosopis juliflora in Bundala National Park of Sri Lanka, (Abstract)*, Proceedings of 17th Agricultural Research Symposium (2018), Wayamba University of Sri Lanka.
5. Rathnayake, C., Ratnayake, R.H.M.K., Ranaweera, B., Suraweera, P.A.C.N.B., Chandrarathne, W.M.K.S., and Karunarathne, K.H.M.I., 2019. *Rehabilitation Behaviour of Native Flora in Bundala National Park and Thabbowa Sanctuary Following Uprooting of Prosopis juliflora*, Proceedings of 18th Agricultural Research Symposium (2019), Wayamba University of Sri Lanaka: 558-562.

Mesquite forest between Bundala and Hambantota, seen from the road








1. A young *Prosopis juliflora* plant.
2. An older tree, showing the low, spreading canopy.
3. A close-up of the foliage.
4. An inflorescence in bud; 5. An inflorescence in flower. Both photographs made at Hambantota town, on a hillside overlooking the bay.
6. & 7. *Prosopis* eradication activity in Bundala NP.

**_Opuntia dillenii_ (Ker Gawler) Haworth and the Cochineal scale insect**

(*Opuntia dillenii*, the name used in Sri Lanka, is a synonym of *Opuntia tuna* – Plants of the World Online [https://powo.science.kew.org/taxon/136534-1])

*O. dillenii,* the prickly pear, belongs to the family Cactaceae and is native to the Caribbean Islands and North and South America. It was introduced to Sri Lanka as an ornamental plant in the 19th century and subsequently became an invasive species along the coastal stretch between Hambantota and the

Bundala lagoon as seen from the main road

Ruhuna National Park, including the Bundala National Park, where it became a serious pest [6]. Physical eradication was difficult owing to the nature of the plant, it being difficult to handle because of the long, sharp spines.

The part played by the Cochineal scale insect in the biocontrol of *Opuntia* in the Bundala NP was first brought to my attention by the SLNHS President Lester Perera, who described his involvement in introducing the insect to Bundala from a northern location. Be that as it may, Galappaththi et al (2021) suggest that the Cochineal insect has been around on *Opuntia* for a long time—perhaps it was introduced along with the cactus in the first place?

***Dactylopius opuntiae*** (Cockerell, 1929) is the species of cochineal identified from Bundala cacti [6]. All species of the family *Dactylopiidae* have females with an oval-shaped body that is purple-red in colour and covered in a white, cotton-like wax. This wax protects the body of the cochineal from heat, cold, and predators. Adult females are sessile and form colonies of up to a few thousand individuals of mixed age, creating conspicuous clusters of white wax all over the plant [7]. The adult female illustrated in Galappaththi et al (2021) was 2.4 mm in length.

*D. coccus*, a closely related species native to the tropical and sub-tropical areas of Mexico and the southwest United States, is said to be about 5 mm long. It is an insect from which the natural dye carmine is extracted [8]. These insects are sessile parasites living on the pads of species of *Opuntia* from which it sucks moisture and nutrients. They produce carminic acid, which protects the insects against predators. The active ingredient is extracted from the insects and eggs and used to produce the dye. Heavy infestations are detrimental to the plants, resulting in their death.

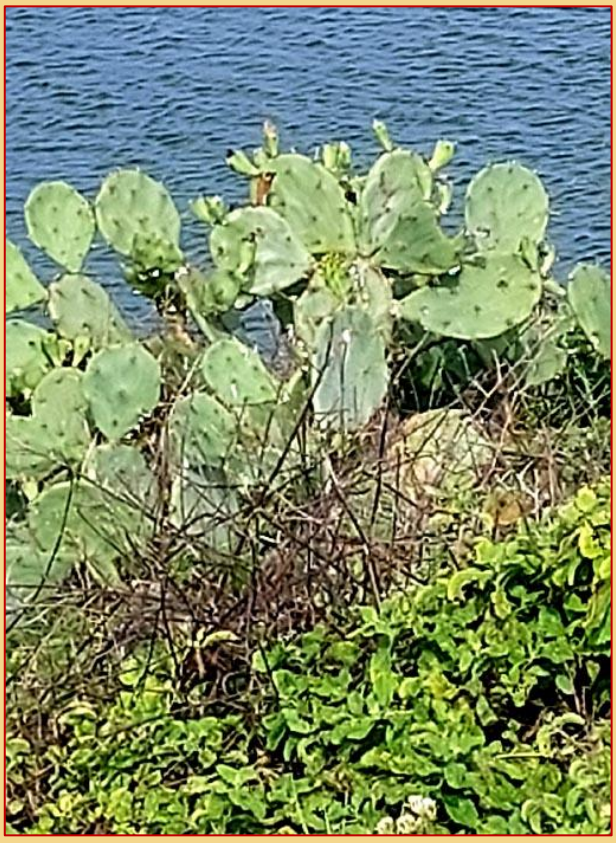
The female insect is wingless, soft-bodied, flat and oval in shape. The juveniles (nymphs) secrete a covering of white, waxy threads to prevent desiccation. They are also able to move to the edge of the cactus pad and allow themselves to be wind-blown to new feeding sites, during the first nymphal, or crawler, stage. Male insects are winged and are seldom seen. They feed till sexual maturity, following which they mate and die.

Cottonwool clumps of *Dactylopius opuntiae* on the pads of *Opuntia dillenii* seen by the roadside at the Bundala lagoon. One such clump macerated on a finger released the carmine dye. Careful parting of the waxy filaments might have shown the insects inside.


6. Galappaththi, M.C.A., Patabendige, N.M., Amarasinghe, S.S., Ranawana, K.B. and Karunaratne, W.A.I.P. (2021). Cochineal Scale Dactylopius opuntiae controls Opuntia dillenii in Bundala National Park, Sri Lanka. *Ceylon Journal of Science,* 50(3) 2021: 297-301. DOI: http://doi.org/10.4038/cjs.v50i3.7912.
7. https://en.wikipedia.org/wiki/Dactylopius_opuntiae
8. https://en.wikipedia.org/wiki/Cochineal

## Postscript

**Godawaya, where part of the Walawe Ganga flows into the Indian Ocean**



The prickly pear cactus is still found in the Bundala National Park, but in small patches. The cochineal scale insect has been able to keep it in check.

The mesquite *Prosopis* is also still found in the National Park, but nowhere as extensive as it had been in the past. There are dense forests of it outside the Park, visible from the road to Hambantota. Physical eradication continues in the Park.

We found plenty of *Opuntia dillenii* with a light scattering of the cochineal scale at Godawaya, on the hillside overlooking the secondary mouth of the Walawe.

The next time readers visit the south, keep your eyes open for the cochineal scale insect wherever you see the *Opuntia* cactus.

Images and text by
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**ADDENDUM**

by Lester Perera

'It is of interest that the first ever biological control of an invasive plant was conducted by the British in 1863, (Tyron 1910) [1]. The existence of the bug in the north of Sri Lanka was noted in Conrad Felsinger's "It was the Babblers Nest" - 1972. The insect was discovered in Mannar in 2018 while I was on a birding trip to observe the critically endangered Spoonbill Sandpiper. Subsequently, the bug was translocated and released in Bundala Village.'

*Dactylopius opuntiae* - gravid females and juveniles

*Dactylopius opuntiae* – winged males

*Dactylopius opuntiae* – 'cotton wool' covered females

**Photo credits: Lester Perera**

Tyron, H. (1910). The 'wild cochineal insect', with reference to its injurious action on prickly pear ( Opuntia spp.) in India, etc. and to its availability for the subjugation of this plant in Queensland and elsewhere. Queensland Agricultural Journal 25: 188–197

*(18) (PDF) Cochineal Scale Dactylopius opuntiae controls Opuntia dillenii in Bundala National Park, Sri Lanka*. Available from: https://www.researchgate.net/publication/354460405_Cochineal_Scale_Dactylopius_opuntiae_controls_Opuntia_dillenii_in_Bundala_National_Park_Sri_Lanka [accessed Nov 11 2024].