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Plant associated fungi from Nauru, South Pacific

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Abstract

Eighteen fungal taxa were collected in Nauru in 1980. They comprised four rust fungi, one smut fungus, several species that cause leaf spots and some saprobes. This is the first report of any plant associated fungi from Nauru.

Key words – first records – oceania – plant pathogens – saprobes

Introduction

The Republic of Nauru lies in the western South Pacific, north east of Solomon Islands. It consists of a small island (21 km^2) that lies just south of the equator (ca. 0º32'S, 166º56'E). The centre of the island is largely denuded of vegetation with limestone pinnacles remaining after extensive phosphate mining removed the guano. There is a narrow inhabited coastal strip with coconut palms and other plants and a small inland lake (Buada Lagoon) around which various plants are cultivated.

About 500 species of plants have been reported as present in Nauru, either currently or in the past (Thaman et al. 1994). However, there appears to be no published records of fungal plant disease from Nauru, and no records of any other saprobic or plant associated fungi. However, fungal skin diseases, such as tinea and ringworm, are common and are present both among Nauruans and contract workers (Anon. s.d.).

Davis et al. (2008) reported on a survey for plant viruses carried out over 5 days in January 2007. They discovered several new records for Nauru including zucchini yellow mosaic virus in pumpkin, bitter gourd (*Momordica charantia*) and ridge gourd (*Luffa acutangula*), cucurbit infecting strain of papaya ringspot virus in bitter gourd, bean common mosaic virus in yard long bean (*Vigna unguiculata* ssp. *sesquipedalis*) and the road-side weed *Passiflora foetida*, cucumber mosaic virus in the roadside weeds *Synedrella nodiflora* and *Physalis angulata*, and dasheen mosaic virus and taro bacilliform virus in taro (*Colocasia esculenta*). A phytoplasma was detected in a *Crotalaria* species showing little leaf symptoms.

Methods

Plants with obvious symptoms of fungal disease were collected on 6 June 1980, during an over-night stop in Nauru. The specimens were air-dried and later sent to New Zealand, where they were identified by standard morphological methods using appropriate published descriptions of the fungi. The specimens were then accessioned in the New Zealand Fungarium (PDD). Subsequently,

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data associated with the specimens was made available through the New Zealand Fungi website (Anon. 2001–2014).

Results

Eighteen species of fungi were found on 13 species of mainly weedy plants and grasses in Nauru. All are new records for Nauru.

Bipolaris sp. on *Melinis repens* (Willd.) Zizka (syn. *Rhynchelytrum repens* (Willd.) Hubbard) (Poaceae) Natal red grass (PDD 42111). Associated with an oval leaf spot on older leaves.

Cercospora canescens Ellis & Martin on *Vigna marina* (Burm. f.) Merrill (Fabaceae) sea bean (PDD 42115). Circular to angular leaf spots are very common on this host plant throughout the tropics and subtropics. The fungus occurs on many members of the Fabaceae.

Cercospora ipomoeae G. Winter on *Ipomoea pes-caprae* (L.) R. Br. (Convolvulaceae) beach morning-glory (PDD 41879). This species is very common throughout the Pacific where it causes a circular leaf spot up to 5 mm diam., grey with dark brown or black border.

Cercospora tridacis-procumbentis Govindu & Thirum. on *Tridax procumbens* L. (Asteraceae) wild daisy, coat buttons (PDD 42875). Leaf spot caused by this fungus is common in the tropics.

Cintractia limitata G.P. Clinton on *Mariscus javanicus* (Houtt.) Merr. & F.P. Metcalf (Cyperaceae) sedge, marsh cypress (PDD 42871). This head smut is circumglobal in the tropics and subtropics. The host plant commonly surrounds parts of Buada Lagoon (Thaman et al. 2009).

Curvularia australiensis (Tsuda & Ueyama) Manamgoda, L. Cai & K.D. Hyde on *Melinis repens* (Willd.) Zizka (syn. *Rhynchelytrum repens* (Willd.) Hubbard) (Poaceae) Natal red grass (PDD 42112). Found on dead leaves, perhaps associated with leaf spots. The species is widespread throughout the tropics and subtropics.

*Curvularia hawaiien*sis (M.B. Ellis) Manamgoda, L. Cai & K.D. Hyde on *Cynodon dactylon* (L.) Pers. (Poaceae) Bermuda grass, doub (PDD 42870); on *Lepturus repens* (Forst. f.) R. Br. (Poaceae) (PDD 41887). Found on dead leaves, perhaps associated with leaf spots. The species is widespread throughout the tropics and subtropics.

Exserohilum holmii (Luttr.) K.J. Leonard & Suggs on *Dactyloctenium aegyptium* (L.) Beauv. (Poaceae) crowfoot (PDD 55977). Associated with small (0.5–1 mm diam.) brown-black spots on leaves, also on dead leaves. Also known in Oceania on crowfoot from Australia, Samoa, Solomon Islands and Vanuatu.

Periconia lateralis on *Lepturus repens* (Forst. f.) R. Br. (Poaceae) (PDD 42109). Saprobic on dead plant material. Circumglobal in tropics.

Pseudocercospora artocarpicola U. Braun & McKenzie on *Artocarpus altilis* (Parkins.) Fosb. (Moraceae) breadfruit (PDD 55980). Leaf blotch, with dingy dark brown to blackish sooty mould growth on lower surface of leaf. Known only from Oceania – American Samoa, Federated States of Micronesia, Fiji, Niue, Rotuma Island, Samoa, Tuvalu, Vanuatu.

Pseudocercospora cruenta (Sacc.) Deighton on *Vigna marina* (Burm. f.) Merrill (Fabaceae) sea bean (PDD 42114). Leaf spots circular or subcircular, sometimes vein-limited, reddish brown, often with chlorotic halo. Found on many legumes but especially *Vigna* species including cowpea and yard long bean

Pseudocercospora stahlii (F. Stevens) Deighton on *Passiflora foetida* L. (Passifloraceae) wild passionfruit (PDD 42116). Leaf blotch with profuse black mould growth on lower surface of leaf. Circumglobal in tropics and widespread in Pacific on wild passionfruit.

Pseudocercospora sp. on *Tournefortia argentea* L. f. (syn. *Messerschmidia argentea* (L. f.) Johnston (Boraginaceae) beach heliotrope (PDD 41640). Associated with a small (1–2 mm diam.), circular leaf spot. The same disease has been also found in the Marshall Islands (PDD 59408).

Puccinia cenchri Dietel & Holw. on *Cenchrus echinatus* L. (Poaceae) burr grass (PDD 42110). Leaf rust is very common on this weed grass throughout the Pacific. Uredinia are found on both surfaces of the leaf

Puccinia lepturi Hirats. f. on *Lepturus repens* (Forst. f.) R. Br. (Poaceae) (PDD 41886, 42108). Leaf rust is found in various Pacific countries where this coastal grass grows. Uredinia form on both surfaces of the leaf.

Scolecostigmina mangiferae (Koord.) U. Braun & Mouch. (syn. *Stigmina mangiferae* (Koord.) M.B. Ellis) on *Mangifera indica* L. (Anacardiaceae) mango (PDD 42117). Angular leaf spot on mango occurs throughout the tropics and is widespread in the Pacific.

Uromyces appendiculatus (Pers.) Unger on *Vigna marina* (Burm. f.) Merrill (Fabaceae) sea bean (PDD 42113). Leaf rust. Worldwide in distribution, particularly common on species of *Phaseolus* and *Vigna*.

Uromyces dactyloctenii Wakef. & Hansf. on *Dactyloctenium aegyptium* (L.) Beauv. (Poaceae) crowfoot (PDD 55970). Leaf rust, circumglobal in the tropics and widespread in the Pacific on this weed grass.

Discussion

Although in no way comparable to the surveys of plant diseases undertaken in Pacific island countries from 1975–1990 (Dingley et al. 1981, McKenzie 1989, 1996, McKenzie & Jackson 1986, 1990a,b, 1996), this brief account presents the first list of plant associated fungi reported from Nauru.

In the 1970s and 1980s the former Air Nauru flew an extensive network throughout the Pacific and Asia, and many passengers and produce transited through Nauru. This was sometimes looked upon as a possible pathway for the introduction of plant pests through Nauru to Australia, New Zealand and other countries. Today, a restricted flight schedule is operated by a much smaller, rebranded airline. However, potential pest concerns were recently realised when the highly invasive and ecologically very damaging yellow crazy ant was found at a single location in Nauru (Darren Ward, Landcare Research, pers. comm.). This elicited an immediate incursion response from New Zealand MPI and Pacific island authorities (Secretariat of the Pacific Community).

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