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A FAUNAL SURVEY OF EAST AUSTRALIAN RAINFORESTS

Studies by the Australian Museum in mid-eastern and north-eastern Queensland and northern New South Wales

Edited by J. Broadbent & S. Clark

INTERIM REPORT

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General Introduction

Rainforest is one of the most important ecosystems found in Australia. It occurs patchily along the east coast and (as monsoonal forest) across the north of the continent. Rainforest itself is of very limited extent, covering some 1.8 million hectares - scarcely 0.24% of the total land surface (Miller, 1974). Since the arrival of European man widespread clearing has taken place. Baur (1957), for example, estimated that only 50% of the rainforests of New South Wales now remain, while Floyd (in Colley, 1975) recently put the figure at 10%. The patchy or "island" occurrence of rainforest has also been accentuated by man's activities. Apart from total clearance for agricultural purposes, rainforests are also selectively logged for timber, some 3.5% of timber production in 1972/73 being from this source. At the same time rainforests are a major source of inspiration, enjoyment and recreation for man and a rich store of biological information. The recreational value of rainforests can be gauged from the estimate that some 59,000 people visited Lamington Park alone during 1972 (Colley, 1975). The exceptional biological richness of rainforests is well exemplified by the fact that 81 (15%) of the 531 species of Australian land and freshwater birds are specific to or reach their greatest abundance in rainforest (Keast, 1959, 1961).

Botanical studies of east Australian rainforests have a long history, although they have been largely concerned with plant systematics until recently. It was not until the late 1950s that the first detailed classifications of east Australian rainforests became available, together with a better understanding of the environmental factors that determine their distribution. Two classifications were developed almost concurrently, one floristic (Baur, 1957) and the other structural/physiognomic (Webb, 1956, 1959). Baur limited his floristic classification to the rainforests of New South Wales. He recognised four main subformations (or leagues), which he referred to as tropical, subtropical, temperate and dry rainforests, and within these subformations he defined six alliances and some 18 associations. Briefly, his tropical rainforests were characterised especially by the Black and White Booyongs

Heritiera (Argyrodendron) spp, Rosewood Dysoxylum fraseranum, and Silver Quandong Elaeocarpus grandis, the subtropical forests mostly by Coachwood Ceratopetalum apetalum, and the temperate forests by Negrohead Beech Nothofagus moorei. The dry rainforest associations were more diverse, but included the true dry rainforests (characterised by Yellow Tulip Drypetes australasica), the littoral rainforests (Cupaniopsis Cupaniopsis anacardioides) and the riverine rainforests (Black Bean Castanospermum australe). This classification, which has since been slightly modified (Baur, 1965), was used as the basis for site selection in northern NSW, although the sites were later identified in terms of Webb's structural and floristic classifications (see below).

Baur found that the distribution of the different rainforest alliances in NSW was determined by a complex interaction of several environmental factors. Not surprisingly he considered rainfall a major determinant of distribution, the main rainforest tracts in NSW being only in areas of high annual rainfall (>1400mm). Temperature was another important factor, with a major influence on the progressive replacement of tropical by subtropical rainforests in lowland areas from north to south in the state. A third important factor was soil nutrient status, particularly phosphorus content. Thus, high phosphorus levels were found to favour tropical rather than subtropical rainforest in northern NSW. Other environmental factors of lesser significance were wind and fire. However, it was the interaction of all these factors which determined the type of rainforest found at any one locality. Topography also had a demonstrable effect on rainforest distribution, through its influence on soil moisture and nutrient status as well as exposure.

To avoid confusion later, it should be noted now that Baur's first three subformations - tropical, subtropical and temperate - are referred to by Webb (1959) as subtropical, warm and cool temperate respectively, and it is these latter terms which will be used in the rest of this report.

Webb's (1959) classification is based on the structural/physiognomic characters of rainforest throughout east Australia. Initially he recognised 12 structural/physiognomic types, but this was later increased to twenty