

## A NOTE ON THE INVERTEBRATES OF THE KALAHARI GEMSBOK NATIONAL PARK (EXCLUDING INSECTS)

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Invertebrates are conservatively estimated to comprise about three quarters of all living species (Wells, Pyle & Collins 1983, *The IUCN Invertebrate Red Data Book*, Gland : IUCN). Approximately 1 400 000 species of invertebrates have been described compared with 250 000 species of flowering plants and only some 46 000 species of vertebrates. According to Wells *et al.*, some 800 000 known invertebrate species are insects and constant new discoveries indicate that this may be only a fraction of the global total.

In the Republic of South Africa (RSA) (as elsewhere), the conservation effort in the past has been directed to the vertebrates. Members of the family Peripatopsidae (phylum Onychophora) constitute the only assemblage of invertebrates to enjoy total protection in the RSA. Some nine species of this living fossil, a segmented worm, occur in isolated localities in evergreen forests primarily along the coastal belt (Hey 1982, *The Fauna & Flora of southern Africa and their Conservation*, Cape Town : Department of Nature & Environmental Conservation, Cape Provincial Administration). Invertebrates are included in the wildlife legislation of many countries, notably in North America and Europe (Wells *et al.*). In the national parks of the RSA these animals are protected by Act No. 57 of 1976 under article 12(2)(a) where the Board of Trustees may take “. . . steps (which) will ensure the security of the animal and plant life in the park, and the preservation of the park and the animals and vegetation therein in a natural state . . .” with “animal” defined as “. . . any member of the animal kingdom” (article 1(i)).

The seemingly uninhabited and sparsely vegetated landscape of the Kalahari Gemsbok National Park (KGNP), is a significant realm for a surprisingly diverse invertebrate fauna which certainly forms an important segment of the faunal biomass of the area. These animals are, however, easily overlooked because of their small size and cryptic behaviour, but never-the-less constitute important operational units of desert life adapted to interactions particular to arid zones (Crawford 1981, *Biology of Desert Invertebrates*, Berlin : Springer-Verlag). What these invertebrate animals are and how they function in their specialised habitat requires elucidation, for both the biotic and abiotic surrounding are influenced by their presence and activities.

The task of describing the invertebrate species encountered in the KGNP and the relationships among them has hardly been commenced at all. With the exception of certain insect orders looked at by entomologists, the rest of the invertebrate fauna has been grossly neglected by visiting and resident scientists to the KGNP in the past. This is strange, for any desert-like environment (encountered in the KGNP) allows a far better understanding of ecological processes in operation due to the relative simplicity of the organisation of the arid ecosystem, in contrast to the often bewildering ecological complexity which is usually associated with rain forests or coral reefs.

Hitherto, there has been no in-depth analysis of the biological content of the waters brought to the surface by the different windmills (of which there are some 84 presently in operation). Consequently we know nothing about the unicellular protozoans or about the diploblastics such as fresh water coelenterates which may occur. The acoelomates as represented by the phylum Platyhelminthes have been looked at in cursory fashion as a result of material becoming available during sporadic post-mortem investigations. The following cestodes are known to occur with hosts given in parentheses : *Raillietina* (*R.*) *trapezoides* (*Desmodillus auricularis*, *Gerbillurus paeba*); *Inermicapsifer* sp. (*Parotomys brantsii*); *Taenia* (*Coenurus*) *parva* (*Thallomys paedulus*), *T. (C.) multiceps* (*Oryx gazella*), *T. acinonyxi* (*Acinonyx jubatus*) and *T. (Cysticercus) tenuicollis* (*Oryx gazella*). A short list of nematodes representing the pseudo-coelomates is also available. These include *Oesophagostomum columbianum*, *Haemonchus contortus* and *Impalaia nudicollis* (*Alcelaphus buselaphus*); *Setaria* (*Artionema*) *hornbyi* and *Agriostomum gorgonis* (*Oryx gazella*) (Theiler 1976, *Host-parasite list compiled for the National Parks Board of Trustees* (as at July 1975), roneod document, 36 pp.).

The eucoelomates of the KGNP seem to be in no better position. Some investigators have had a fleeting look at some of the phyla such as the annelids, the cheliceratids, crustaceans, uniramids and molluscs. Other minor phyla of eucoelomates may or may not occur in the KGNP. The fact that one does not know anything about them in the KGNP does not imply their absence. Oosthuizen (*pers. comm.*) encountered no leeches on a single visit to the KGNP in the early sixties. The arachnid branch of the cheliceratids occurring in the KGNP are practically unknown. Van Graan (*pers. comm.*) collected some fairy shrimps (*Streptocephalus* sp.) from water in the Craig Lockhart windmill in the upper Auob River during the early seventies, but no further attention was given to these or any other fresh water crustaceans. Lamoral (1973, *Koedoe* 16: 83-102, and 1977, *Koedoe* 20: 101-108) discussed aspects of the orders Solifugae and Scorpiones one encounters in the KGNP, as well as predation on terrestrial molluscs by scorpions (Lamoral 1971, *Ann. Nat. Mus.* 21(1): 17-20) while Theiler (1962, *The Ixodoidea parasites of vertebrates in Africa south of the Sahara (Ethiopian Region)*, roneod report to the Director of Veterinary Services, Onderstepoort) listed the ticks and associated forms as they were known at that point in time. This list was followed by papers by Nevill (1964, *Onderstepoort J. Vet. Res.* 31: 59-68), De Vos (1977, *Koedoe* 20: 169-174) and Theiler (1977, *Ann. Cape Prov. Mus.* 2: 212-222) on the order Acari with emphasis on the sand tampan *Ornithodoros savignyi*. The subphylum Myriopoda, incorporating centipedes and millipedes (class Chilopoda and class Diplopoda re-

spectively) are well known examples of the arthropod fauna of the KGNP, but as yet no inventory has been made of the taxa which occur within the park boundaries. In addition apart from Lamoral's (1971) paper mentioned above, in which reference was made to the terrestrial snail *Xerocerastus (X). burchelli*, no additional information is available on the molluscs of the KGNP, either as fossil, subfossil or other extant species.

It is evident that much remains to be done (even at the lowly collector's stage) on the invertebrates of the KGNP. A concerted research effort is required. The lack of data on taxonomy, population dynamics and the long-term survival of these phyla in the KGNP hampers the inclusion of these important biological components in however preliminary a management plan which is being compiled for the KGNP as part of the ecosystem of the Kalahari.