

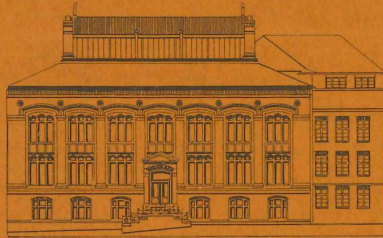
4. Symposium

FAUNA UND FLORA DER KAPVERDISCHEN INSELN

Kiel, 8. - 10. Oktober 1987

Abstracts

— Englische Kurzfassung der Vorträge —

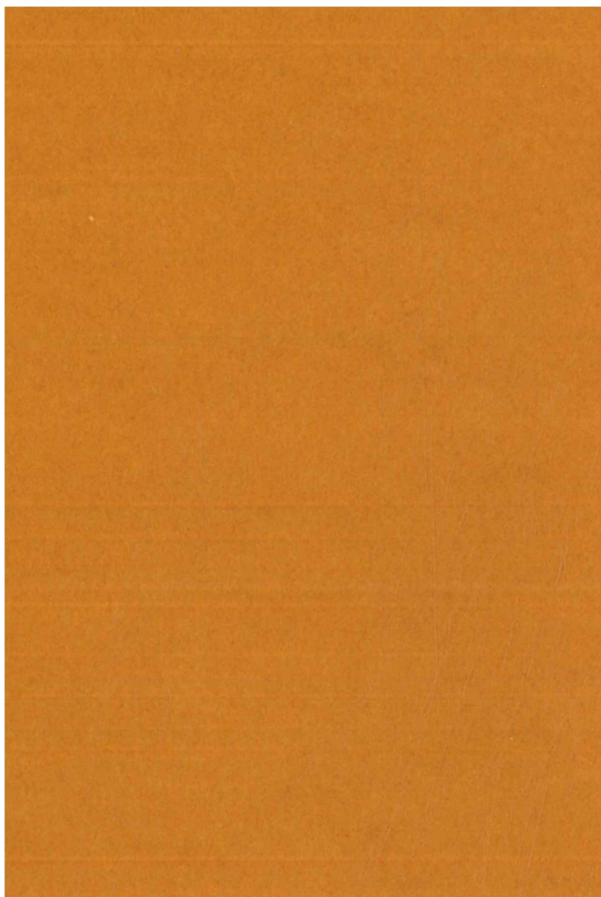


ZOOLOGISCHES
MUSEUM

Hegewischstrasse 3

CHRISTIAN-ALBRECHTS-UNIVERSITÄT
ZU KIEL

Arbeitsblätter Nr. 16



4. Symposium
FAUNA UND FLORA
DER KAPVERDISCHEN INSELN

Kiel, 8. - 10. Oktober 1987

Abstracts
— Englische Kurzfassung der Vorträge —

Arbeitsblätter des Zoologischen Museums Kiel, Nr. 16
September 1987

HINWEISE

Tagungsbüro bei der Museumsaufsicht im Erdgeschoß

geöffnet: Mittwoch: 14 - 18 Uhr

Donnerstag und Freitag: 8 - 18 Uhr

Bei allen Fragen und Wünschen wenden Sie sich bitte an die Mitarbeiterinnen und Mitarbeiter des Hauses. (Kenntlich durch ein Namensschild.)

Teilnehmer und Interessenten an der Exkursion wenden sich bitte sofort an Herrn Dahms.

Einen Straßenplan der Umgebung des Museums finden Sie am Ende dieses Heftes.

PROGRAMM

Mittwoch, 7.10.1987

- 16.15 Uhr Begrüßung. Grußworte. Eröffnung der Ausstellung "Reisen in ein Entwicklungsland - Biologen arbeiten auf den Kapverdischen Inseln" durch den Kanzler der Christian-Albrechts-Universität im Zoologischen Museum.
- Einführung in die Ausstellung.
- 19.00 Uhr Geselliges Beisammensein in der "Seeburg"
(am Fördeufer nahe dem Museum).

Donnerstag, 8.10.1987

- 8.15 Uhr Begrüßung durch den Vorsitzenden der Leitung des Zoologischen Instituts und Museums Professor Dr. F.-H. Ullerich.
- 8.30 Uhr H. Klug: Neue Forschungsergebnisse zur Geomorphologie der Kapverden.
- 9.00 Uhr A. Van Harten: Überblick und Fortgang der Erfassung der Entomofauna der Kapverden.
- 9.30 Uhr H. Hölzel & P. Ohm: Die Neuropteren der Kapverdischen Inseln.
- 10.00 Uhr M. Geisthardt: Gedanken zur Besiedlung der Kapverden durch Tenebrionidae.
- 10.30 Uhr A. Van Harten: Die Schildläuse der Kapverden.
- 11.00 Uhr C.H.J.M. Fransen: Biogeographical aspects of the caridean shrimpfauna of the Cape Verde Islands.
- 11.30 Uhr M. Türkay: Die Crustacea-Decapoda-Reptantia der ostatlantischen Kuppen - ein Modell für Inseln ohne Litoral.
- 12.00 Uhr Allgemeines
- 12.15 Uhr Mittagspause
- 14.00 Uhr P. Wirtz: Die Zoogeographie atlanto-mediterraner Blennioidea, insbesondere die Ergebnisse einer Reise auf die Kapverden.
- 14.30 Uhr O. Koedijke & D. de Bruyn: Auf der Suche nach Vögeln im Winter 1987, eine Bestandsaufnahme.
- 15.00 Uhr J.C. Den Hartog: Birds observations in the Cape Verde Islands.

- 15.30 Uhr A.M.J. Evers: Zur Ökologie und Verbreitung von *Ifnidius* ESCALERO und *Macrotrichopherus* EVERS.
- 16.00 Uhr C. Lange: Die Orthopteren Madeiras und ihre zoogeographischen Beziehungen.
- 16.30 Uhr G. Follmann: Flechtenflora und Flechtenvegetation von Madeira. Ein chorologisch-soziologischer Abriß.
- 17.00 Uhr F.E. Beyhl: Beobachtungen über den Blütenbesuch madeirischer Eidechsen.
- 17.30 Uhr Ende
- 19.30 Uhr Öffentliche Filmvorführung: "Die Hoffnung der Leute auf Fogo und Brava". Im Vortragsraum des Zoologischen Museums.

Freitag, 9.10.1987

- 8.00 Uhr Ch. Brochmann: Evolutionary patterns in the endemic vascular flora of the Cape Verde Islands.
- 8.30 Uhr R. Sergel & M. Baez: Zur biotischen Diversität ostatlantischer Inseln und ihre Implikation für die Theorie der Inselbiogeographie.
- 9.00 Uhr V. Voggenreiter: Fortschritte der Kartierung der Flora auf Tenerife und im kanarischen Westarchipel.
- 9.30 Uhr T. Von Wachenfeldt: Growth-rates of some Cape Verdian seaweeds and fishes, and tentative cheap culture systems.
- 10.00 Uhr W.F. Prud'homme van Reine: Biogeography of the seaweed Flora in Macaronesia.
- 10.30 Uhr H. Muhle: Zur Bryologie der Kapverden.
- 11.00 Uhr B. Mies & G. Follmann: Die Höhenstufen kapverdischer Flechtenvereine.
- 11.30 Uhr R. Lösch, F. Beyhl, B. Mies & B. Schweihofen: Relative Standortkonstanz der Federbuschvegetation auf den mittelatlantischen Inseln und die klimatisch-orographischen Voraussetzungen einer Waldklimax auf den Kapverden.
- 12.00 Uhr Mittagspause
- 14.Uhr F.E. Beyhl, R. Lösch, B. Mies & B. Schweihofen: Bilden die Kapverden ein einheitliches Florengebiet?
- 14.30 Uhr: F.E. Beyhl: Betrachtungen zu den Artenzahlen auf den Mittelatlantischen Inseln.
- 15.00 Uhr F. Hiemstra: The vegetation of the wells in Planalto Leste, Sto. Antao.

- 15.30 Uhr N. Kilian: Die Lactuceae (Asteraceae) der Kapverden.
- 16.00 Uhr W. Lobin: Biogeography of the Cape Verde Islands.
- 16.30 Uhr Ende
- 19.30 Uhr Öffentliche Filmvorführung: "Teneriffa - ein ökologisches Modell".
Im Vortragsraum des Museums.

Samstag, 10.10.1987

- 9.00 Uhr Ganztags-Exkursion zu den Halligen im Nordfriesischen Wattenmeer.
Wir fahren mit dem Wagen an die Nordseeküste, mit dem Schiff durch das Wattenmeer und gehen zu Fuß über eine Insel. Mittagessen und "Pharisäer" (anscheinend alkoholfrei) werden auf der Hallig eingenommen. Die Rückkehr ist für ca. 18.00 Uhr vorgesehen. Wegen einer gewissen Unsicherheit bedingt durch Ebbe und Flut kann sich der Termin verschieben. Für die Exkursionsteilnehmer wird eine weitere Übernachtung in Kiel notwendig werden. Die Unkosten zu dieser Fahrt belaufen sich auf ca. 30,- DM. Teilnehmer und Interessenten wenden sich bitte sofort an Herrn Dahms.

New investigations on the morphology of the Cape Verde Islands

Heinz KLUG & Sabine GIER

The Cape Verde archipelago is characterized by a sharp morphological contrast between the low eastern islands with mild relief and the mountainous, strongly differentiated other islands.

On the basis of their more advanced geomorphological development the eastern islands have been considered the older ones. Due to recent geological investigations the old upthrown basement of submarine volcanic rocks can be observed on at least some of the western islands as well. Therefore unequal tectonic uplift could account for the geomorphological differentiation as well as age, climatic factors and individual volcanic history in the course of alternating eruptive and erosive phases.

Valley formation in the mio-pliocene volcanic series that form the principal relief of the islands took part under more humid tropical conditions and accelerated chemical weathering.

As a rule, amphitheatre-headed valleys like in northeastern Santo Antão were formed where primary relief was high. They are characterized by steep, high headwalls which are cut back actively by numerous parallel ravines in favor of growing foothills at their base. In central Santiago broad open V-shaped valleys represent a stage of development in which the upper slope sections are strongly eroded. Their erosional remains can only be observed on the water divides.

On lower relief broad valleys like in Sal were formed.

Due to a change of climate towards more arid conditions as well as to the effects of self-aridising by continuous lowering of the relief V-shaped valleys which are characteristic of pliocene and quaternary volcanic series were formed. This type of valley is typically represented in the achadas of Santiago.

In several valleys river terraces corresponding with marine terraces can be observed, thus indicating that valley formations has been influenced by eustatism during pleistocene. Without subsequent uplift valley mouths have been flooded by the post-glacial transgression and transformed into rias-coasts (i.e. in northeastern Santiago).

Überblick und Fortgang der Erfassung der Entomofauna der Kapverden

Anton VAN HARTEN, S. Jorge

Seit Beginn des GTZ-Projektes "Integrierte Schädlingsbekämpfung" 1978 wird versucht, die Kenntnis über das Vorkommen von Insekten- und Arachniden-Arten auf den Kapverden zu verbessern. Am Anfang wurden vor allem phytophage Arten, die Kulturpflanzen befallen, sowie Parasiten und Predatoren dieser Schädlinge zur Bestimmung verschickt. Ab 1982 hat der Referent, teils als Projektarbeit, teils als Freizeitbeschäftigung, Material von fast allen Insekten- und Arachniden-Ordnungen gesammelt und versucht, dieses Material von Spezialisten bestimmen zu lassen.

Dabei wird nach folgendem Prinzip vorgegangen: Wenn ein interessierter Taxonom gefunden ist, bekommt dieser alle gesammelten Exemplare seiner Gruppe für seine Sammlung überlassen, er muß nur, nach Abschluß dieser Arbeit, von jeder identifizierten Art einige Tiere präpariert und etikettiert an die Sammlung des INIA zurückschicken. Auf diese Weise wurden schätzungsweise 80-100.000 Exemplare von Insekten und Arachniden an ca. 50 Spezialisten in Europa, Nordamerika, Asien und Afrika verschickt.

Leider geht die Bestimmungsarbeit nicht immer so schnell voran wie gewünscht, vor allem, da die kapverdianischen Arten hauptsächlich zur äthiopischen Fauna gehören, die im allgemeinen sehr schlecht bekannt ist. In einigen Fällen war es bisher unmöglich, einen Spezialisten zu finden. Bei diesen Gruppen liegt daher die Kenntnis unter dem Durchschnitt, was für fast alle Familien der Diptera (Fliegen und Mücken) und bei den Ameisen (Familie Formicidae) der Fall ist.

Mehr oder weniger regelmäßig erschienen daher Arbeiten über das auf diese Weise zusammengetragene Material. Dabei wurden bisher eine neue Strepsiptera-Gattung sowie drei neue Strepsiptera-Arten, drei neue Arten von Psocoptera, eine neue Art von Bombyliidae und vier neue Arten von Bodenmilben (Oribatida) beschrieben.

The Neuroptera of the Cape Verde Islands

Herbert HÖLZEL, Annenheim & Peter OHM, Kiel

A first review on "Tiergeographische und ökologische Aspekte der Neuropterenfauna der Kapverden" was given at Frankfurt 1981 (Ohm & Hölzel 1982). On this occasion 26 species of the order Planipennia (Neuroptera, Lacewings) were recorded. In recent years the archipelago was again visited by one of the authors (OHM) in october 1982 and in january 1985 and Neuroptera were collected on Sal, Vicente, Santo Antao and Santiago. Important material, collected over the whole year by A. van Harten at Sao Jorge (Santiago) could also be evaluated.

Up to now 29 species of Neuroptera belonging to 5 families Coniopterygidae (2), Hemerobiidae (5), Chrysopidae (10), Ascalaphidae (1) and Myrmeleonidae (11) have been reported from the archipelago. The present state of knowledge allows a zoogeographical statement on nearly all of these species: 15 (52%) definitely belong to the Afrotropical region (5 probably are elements of the savannah belt, 4 are widely distributed over the region and 6 are only scanty known), 4 species (14%) belong to the Palaearctic region, and 8 species (28%) have until now exclusively been recorded from the Cape Verde islands; 2 species are distributed over large regions of the world (several zoogeographical regions).



Colonization of the Cape Verde Islands by Tenebrionidae (Coleoptera)

M. GEISTHARDT, Wiesbaden

Besides the Carabidae, Staphylinidae and some other families, the Tenebrionidae are the most successful coleopterous group on the Cape Verdes. Based on the study of all endemical *Oxyccara*-species and of the three endemical genera (*Trichopodus*, *Melanocoma*, *Platyprocnemis*) some aspects concerning the colonization of the Cape Verdes by Tenebrionidae and some questions of taxonomical interest are discussed.

Die Schildläuse der Kapverden

Anton VAN HARTEN, S. Jorge

Die ersten Angaben über Schildläuse der Kapverden sind im Buch von CHEVALIER über die Flora der Kapverden (1935) zu finden: Dr. VAYSSIÈRE erkannte im von CHEVALIER gesammelten Material 6 Arten. Bei einer dieser Arten (Aspidiotus hederae) handelt es sich wahrscheinlich um eine Fehlbestimmung.

In den Jahren vor der Unabhängigkeit der Republik Kapverden erschienen von portugiesischen Autorinnen vier Publikationen über kapverdianische Schildläuse. Dabei wurden insgesamt 12 Arten angegeben.

SCHMUTTERER, PIRES und KLEIN-KOCH (1978) gaben in der Arbeit, die zur Grundlage des GTZ-Projektes wurde, 20 Arten von Schildläusen auf den Kapverden an. Eine wurde nur bis zur Gattung identifiziert (Phenacaspis =wahrscheinlich Duplachionaspis stanotophri).

Der Referent hat seit 1982 über hundert Schildlausproben gesammelt, die von Dr. JENNIFER COX und Dr. D.J. WILLIAMS bestimmt wurden. 33 Arten wurden von ihnen erkannt. Die Ergebnisse sollen gemeinsam publiziert werden.

Von den Kapverden sind jetzt 37 Arten Schildläuse bekannt, darunter zwei neue Arten (Planococcus sp. n. von Ficus gnaphalocarpus und Asterolecanium sp. n. von Mangifera indica). Wahrscheinlich können auch in Zukunft noch einige wenige weitere Arten der Liste hinzugefügt werden.

Eine Art, Vinsonia stellifera, kommt nur auf der Insel Santo Antao vor. Die Schildläuse sind auf den Kapverden eher lästig als wirklich schädlich. Lediglich Maniok wird routinemäßig behandelt: Die Stecklinge, die möglicherweise von Aonidomytilus albus befallen sind, werden vor der Auspflanzung in eine Insektizidlösung getaucht.

Biogeographical aspects of the caridean shrimp-fauna of the Cape Verde Islands

C.H.J.M. FRANSEN, Leiden

A list of 38 benthic and pelagic caridean shrimp species known from the marine littoral to abyssal waters of the Cape Verde Islands will be presented. This list will be updated with the preliminary results of the CANCAP IV and VII oceanographic expeditions with the 'Tydeman' to the Cape Verde Islands in 1982 and 1986.

Biogeographical relationships of the species will be discussed with special reference to the west african caridean shrimp fauna. Comments will be made about the relation between the biology and distributional pattern in certain species.



Crustacea Decapoda Reptantia der ostatlantischen Kuppen.

Michael TÜRKAY, Frankfurt am Main

In dem Beitrag wird die Fauna der Crustacea Decapoda Reptantia folgender nordostatlantischer untermeerischer Kuppen dargestellt: Gettysburg Bank, Gorringe Bank, Josephine Bank, Große Meteor Bank, Seine Bank, Princesse Alice Bank. Diese wurden durch die Expeditionen des Fürsten ALBERT I von Monaco und 1967 bzw. 1970 sehr viel genauer von F.S. "Meteor" erforscht. Der Schwerpunkt lag hierbei auf der Josephine- und Großen Meteor Bank. Bisher sind 29 Arten der behandelten Tiergruppe von den Kuppen nachgewiesen worden. Diese verhältnismäßig sehr arme Fauna entspricht im Wesentlichen der des Festlandes bzw. der Azoren in vergleichbaren Tiefen. Manche Arten erreichen auf den Kuppen die größte Wassertiefe, während sie an Inseln und Festland eher sublitoral vorkommen. Insgesamt trägt die Fauna ein ostatlantisches Gepräge, westatlantische Beziehungen werden für die Große Meteor Bank diskutiert.

Zoogeography of the Atlanto-Mediterranean Blennioidea, in particular the results of a journey to the Cape Verde Islands.

Peter WIRTZ, Freiburg i. Br.

The fish families Blenniidae, Clinidae, Labrisomidae and Tripterygiidae contain 44 species that live either in the Mediterranean Sea or in the Eastern Atlantic or in both areas. For each of the 44 species, a distribution map was constructed - based on approximately 4000 records from the literature and from museum specimens and based on own observations made during journeys to the Mediterranean Sea, Great Britain, Madeira, Morocco, the Cape Verde Islands, Senegal, Sierra Leone, Ghana, Togo and Cameroon.

Seven of the 44 species are endemic to the Mediterranean Sea and Black Sea; their closest relatives live at the coast of Westafrica. Six additional species apparently evolved in the Mediterranean Sea but have emigrated through the Strait of Gibraltar into the Eastern Atlantic in comparatively recent time. The four amphi-atlantic species have their closest relatives in the Western Atlantic and apparently originate from there.

At the coast of the Cape Verde Islands, the following eight species belonging to the superfamily Blennioidea were found:

Labrisomidae: *Labrisomus nuchipinnis*;

Blenniidae: *Ophioblennius atlanticus*, *Entomacrodus cadenati*, *Scartella cristata*, *Parablennius sanguinolentus parvicornis*, *P. pilicornis*, *P. goreensis*, and an undescribed species of the genus *Lipophrys* (WIRTZ & BATH, in print). Records of *Lipophrys velifer* (NORMAN 1935) and *Lipophrys bauchotae* WIRTZ & BATH 1982 from the Cape Verde Islands are confusions with this undescribed species that is probably endemic to the Cape Verde Islands. Similarity indices (Jaccard coefficients) were calculated for 25 different geographical areas and used for a cluster analysis. The resulting clusters correspond almost perfectly to the currently recognized zoogeographical regions. A comparison of the similarity indices shows only a weak affinity of the Blennioidea of the Cape Verde Islands to those of more northern areas and a stronger affinity to the Blennioidea of the Gulf of Guinea than to the Blennioidea of the much closer coast of Senegal.

References:

- WIRTZ, P. & H. BATH: *Lipophrys bauchotae* n.sp. from the eastern tropical Atlantic (Pisces: Blenniidae). Senckenbergiana biol., 62: 225-232, 1982.
- WIRTZ, P. & H. BATH: *Lipophrys caboverdensis* n.sp. from the Cape Verde Islands. - Senckenbergiana biol., in print.
- WIRTZ, P. & J. HELLINGER: Zur Zoogeographie der atlantomediterranen Blennioidea, mit besonderer Berücksichtigung der Kapverden. - Cour.For-sch.-Inst.Senckenberg: 95: 99-102, 1987.
-

Birdwatching during the Great Drought

O. KOEDIJKE & D. DE BRUYN, Sint Marten

In December 86, January and February 87 we visited all inhabited islands. During a journey in the winter of 1966 DAVID and MARY BANNERMAN observed about 150 species. After the Great Drought we saw only about 60 species and of many only few specimens. A lot of birds are threatened not only by the drought, but also by people eating them: We haven't seen any ducks; Sparrows (House Sparrow, Spanish Sparrow, Rufous-backed Sparrow) only in small number and Cattle-Egrets are also eaten.

Coastal birds are suffering less directly from the lack of rain. On some beaches you can see a lot of birds : Especially Turnstones, Sanderlings, Dunlins, Whimbrels and sometimes a Little Egret, a Greenshank, a Black-winged Stilt or a Ruff and Reeve.

The White-headed Kingfisher become rare because of the drought, but he is not very shy, so he is to be seen often. Everybody considers this bird as too beautiful to be eaten.

Birds of the Cape Verde Islands: Observations made during the CANCAP VII Expedition (8. August - 13 September 1986), status of populations and conservation

J.C. DEN HARTOG, Leiden

A survey will be presented of the birds observed during the CANCAP VII expedition of the Rijksmuseum van Natuurlijke Historie, Leiden, including some unusual records and observations. Special attention will be paid to bird populations of the uninhabited islands Cima and Razo, also from the viewpoint of conservation.

Ecology, dispersion and distribution of *Ifnidius* ESCALERA and *Macrotrichopherus* EVERS

Alfons EVERS, Krefeld

The Malachiidae-species *Ifnidius microphthalmus* ESC., *milleri* WOLL., *atlanticus* EVERS and a new species *petricola* PLATA belong, together with *Macrotrichopherus spectabilis* EVERS to a curious group of Malachiidae. The biology of the species was completely unknown. Only the very small eyes were a significant indication, that the species of this group are not phototropic, as Malachiidae usually are. It seemed probable, that the species lived in a dark habitat.

Since the first Canarian species of *Ifnidius* was found some years ago at Lanzarote, we have more information on the biology. The species live in an obscure habitat, under stones in the high tide zone on the Atlantic shores. The only nutrition rich on proteins in this habitat are the eggs of Isopoda. It seems to be acceptable, that these eggs are the nutrition of the larvae and imagines. The distribution of the species is according with this probable trophic factor. All species live on the Atlantic coasts: Sidi Ifni (SW Morocco), El Msaidir (SW Morocco), Gran Piton (Selvagens), Lanzarote (Canary Isles) and S. Vicente (Cape Verde).

All species are brachypterous. The usual dispersion of Malachiidae by flight only is possible for winged alleles, if such alleles occur rather frequently. If not so, the species must possess other strategies for dispersion. It seems probable that the species are drifted as eggs, larvae or imagines with sea-weeds or detritus.

The Orthoptera of Madeira and their geographical relationships

Christian LANGE, Kiel

This execution is supposed to give a survey of the grasshopper-fauna of Madeira, on base of a travel during September 1986.

On the Madeira-archipelago a total of 25 species is known, which belongs to the families Gryllidae, Tettigoniidae and Acrididae. 4 species (*Metrioptera barreto*, *Psalmatophanes barreto*, *Euchorthippus madeirae* and *Calliptamus madeirae*) are endemic. This is 16% of all known species, and a comparatively small number. A second group of species is more widely distributed (palearctic, palearctic-ethiopic or cosmopolitan). A third is restricted to the Iberian Peninsula or North Africa (*Acheta canariensis* and *Schistocerca gregaria*).

Antaxius spinibrachius is recorded for the first time from Madeira, hitherto it was known only from Portugal and Spain.

On Porto Santo I collected one specimen of a species from the genus *Metrioptera*. This probably belong to a new taxon, but more material is needed to verify this.

6 species are assumed to be imported by human activities. The successful naturalization of these species could have been caused by the clearing of the autochthonous forests as well as through cultivation of big areas, which both could have favoured the living conditions of grasshoppers.

The Azores have 8 and the Canary Islands have 14 species in common with Madeira.

Under the aspect of the history of the colonization of the Mid-Atlantic Islands the phylogenetic relationships between *Psalmatophanes*, a genus endemic on Madeira (1 species), the endemic genus *Calliphona* (3 species) from the Canary Islands and the genus *Tettigonia*, which is distributed in Europe and North Africa, will be of special interest.

In a first provisional survey distribution maps are presented, which include the altitude-zones and documentate the distribution of the endemic species.

Beobachtungen über den Blütenbesuch madeirischer Eidechsen

F.E. BEYHL

Observations of flower-visiting Madeiran lizards (cf. *Lacerta dugesii*) are reported and compared to records of Canarian lizards feeding on plant material.

On The Biotic Diversity of Eastern Atlantic Islands and Its Implication for The Theory of Island Biogeography

Rudolf SERGEL, Hamburg und Marcos BAEZ, La Laguna

Islands are known as natural laboratories for evolutionary and ecological studies of organisms and biotic communities. Island fauna and flora patterns found in different studied biotas led to the island biogeographic theory, stating for islands impoverishment of floras and faunas in relation to adjacent mainlands, special evolutions resulting in occurring endemisms, occurrence of specialized adapted and ecological types without equivalences in original taxa of mainlands, preservation of relic forms, species-area-relations influenced also by habitat diversity, continental distance, and geological age of the islands.

The Eastern Atlantic archipelagos situated in front of the Western European and African continents composed of islands of differing areas and habitat diversities, continental distances and geological ages, supply possibilities for the study of island taxa and communities.

The characteristics of island communities can be found in these biotas exemplarily. The spread potential of organisms shelters a filter function in taxonomic diversity of the island systems. Multivariate plots show different environmental factors influencing species diversity of island biotas. Discussed examples underline the importance of evolutionary events resulting in speciation in their contribution to species numbers of islands beside immigration equilibria. Species numbers of archipelagos are also influenced by their island numbers offering possibilities for the growth of island taxa. Availability of resource quantities and diversities, as well as separations of areas into geographic units determine species numbers.

The progress of mapping the flora of Tenerife and the Western Canary Islands

V. VOGGENREITER, Bonn

Geobotanical distribution map series shown as maps and slides resulting from an intensely field investigation are an important basis for biogeographical and ecological research in connection with the planning of nature protection in the Canary Islands.

Data material for composing distributions was received by own field work on Hierro, La Palma, Gomera, Tenerife and Gran Canaria (1966-1977). The standard mapping grid used in the Atlas Fitocorologico de Tenerife (1986 Mscr.) and in the Atlas Fitocorologico de Canarias Occidentales (1987 Mscr.), obtained by dividing each 25 km² - Super-quadrante - into nine ninths (1.66 km x 1.66 km units) is of very practice use.

Further and very important chorological data material was found in the publications of vegetation and flora relevees within some periodicals. They include descriptions of localities, lists of assoziating species and some distribution maps, also. Besides of it datas, obtained of dissertations, of more than 10 very useful excursion protocolls and of the collections kept in the herbarium of Senckenberg-Museum, were mapped.

Important botanists like Sventenius, Wildpret de la Torre, Kunkel and Bramwell and their cooperators and many others have piled up such a big number of publications that a whole years work of mapping the data resulted. It is intended to compile the Red Data Book with the West Canarian areal types. Main purpose of the whole project is to intensify the knowledge of threatened insular biotope types before they are destroyed and to intensify their protection. Besides that, to stimulate nature protection.

Biogeography of Macaronesian seaweeds

W.F. PRUD'HOMME VAN REINE, Leiden & C. VAN DEN HOEK, Haren

For the mid-atlantic islands (Macaronesia s.l.) 595 species of seaweeds have been recorded so far. For the central archipelagos (Macaronesia s.s.) 509 species of seaweeds have been recorded (324, 91 Phaeophyceae and 94 Chlorophyceae). Twenty-five of these seaweeds of Macaronesia s.s. have been described as endemic algae. The taxonomic status of these 'endemics' is from clear, however.

Studies on relatedness of these seaweed floras to seaweed floras of surrounding areas using clustering methods resulted in separate and individual positions for seaweed floras of the Cape Verde Islands. The Azorean seaweed floras have intermediate positions between the seaweed floras of Macaronesia s.s. and these of the warm temperate Eurafrikan coasts (the subtropical African coast excepted). The seaweed floras of the archipelagos of Macaronesia s.s. form a distinct cluster, quite distantly related to seaweed floras of the warm temperate Eurafrikan coasts, the subtropical African coast, tropical Africa, the Azores and the Cape Verde Islands.

The tropical-to-subtropical portion, and to some extent also the subtropical-to-Southern Cooler Warm Temperate portion of the assembled seaweed flora of Macaronesia s.s. have a distinct E American imprint, while virtually all other seaweeds of this flora are shared by the Eurafrikan mainland seaweed floras. Unimpeded seaweed dissimination between the Cape Verde Islands, the Canary Islands and the African mainland is probably not possible. If non-environmental, probably historical factors, would be responsible for the individual nature of the Macaronesia (s.s.) seaweed flora two different hypothetical scenarios can be imagined: a late pleistocene one and a cenozoic one. In the late pleistocene scenario especially the temperatures during the last glacial period may have been crucial. This would imply that the strictly subtropical seaweeds as well as the tropical-to-subtropical seaweeds of Macaronesia s.s. must have reached the islands after the last glaciations, coming either from tropical America or from the much poorer tropical African coasts. The coenozoic scenario would imply that the tropical-to-subtropical species, and possibly also the strictly subtropical species of the Macaronesian (s.s.) seaweed flora are chance survivors of the progressive coenozoic extinctions of the miocene Tethyan seaweed flora.

Growth-rates of some Cape Verdian seaweeds and fishes, and tentative cheap culture systems.

Torgny VON WACHENFELDT, Lund

With the aim to introduce aquaculture at Cape Verde, some native species of fish and macroalgae have been screened concerning growth-rates, nutrient requirements etc. Results have now been obtained for 3 species of fish; 2 *Mugil* species (Tainha preta and Tainha branca, local names) and 1 *Trachurus* sp. (Chicharro, local name), and for the algae *Ulva* sp., *Enteromorpha* sp. and *Sargassum* sp.

Plans for cheap, but effective cultivation-installations, have been designed.



A contribution towards the moss flora of the Cape Verde Islands

Hermann MUHLE, Ulm

Data on moss distribution are important to be generalized for two reasons. Firstly ecological work on a particular moss needs not to be looked upon in isolation, but can be related to other species. Secondly repeated distribution pattern may lead to a factor of overriding importance and help to understand the ecology of a particular species.

From the 97 mosses known to occur on the Cape Verde Islands 10 species (10,7%) are apparently endemic. The mosses belong to 20 families with 50% having only 2 (or less) species in those entities. From the 97 species about 55% show special surface structures (e.g. mamillate, papillose, crenulate surfaces) and from 45% (eastern USA 8,7%) of the mossflora no sporophytes are known. More than 15% (eastern USA 12,3%) produce vegetative propagula. Height above the surface of moss shoots reveals about 45% less than 1 cm, 1 - 5 cm about 38% and more the 5 cm height about 3%.

The geographical relationships of the mossflora are discussed within the framework of biogeographical parameters like island size, topography related type of climate and species diversity. Distributional types like Mediterranean, African and Macronesian elements will be discussed with the help of altitudinal gradients on the Island of Sto. Antao.

The altitudinal zonation of Cape Verdean lichen associations

An overview

Bruno MIES & Gerhard FOLLMANN, Cologne

Although the inventory of Cape Verdean lichens is far from being complete (actually 225 species), frequent and characteristic representatives allow a clear demarcation of the altitudinal ranges and the most important lichen associations. The windward slopes of the islands swept by the trade-winds (NE) show the densest lichen cover, the highest species diversity, and the most differentiated community sequence. On the lee-sides the lichen associations are reduced and ascend to greater altitudes. The altitudinal zones of the higher islands (SA, SN, ST, FO, BA) correspond to those of the lower islands (SV, S, BV, MO) in connection with relief and rising trade-wind clouds. Therefore the altitudinal zones of the latter are generally lower, nevertheless they all reach a semihumid cloud zone (SV: 500 m, S: 300 m). The rocky coastal belt is covered by maritime lichen species (approx. up to 400 m) whose communities correspond to the *Roccellion tinctoriae*, which is also found on the other Macaronesian archipelagos, especially the Canaries. With increasing height the following lichen associations can be distinguished: the *Lecanoretum sulphurellae* ass. nov. in the basal range (up to 50 m for SV), the *Roccelletum canariensis* in the central range (50 - 250 m for SV), the *Ramalinetum maderense* ass. nov. (200 - 350 m for SV), and the *Ramalinetum rubrotinctae* ass. nov. (350 - 450 m for SV) in the transitional range to the lower cloud zone. The first is dominated by crustose, the three others by fruticose life forms. Studies on the influence of salt spray, on the relations of aridity and the contrast of humidity and salinity, as well as on the extrazonal location of *Roccellion* communities in the inland mountains have not yet been completed. The transition from the lower to the central cloud zone (550 - 700 m for SV, 900 - 1200 for SA) is shifting. Some new findings (e.g., *Nephroma laevigata*, *Parmeliella atlantica*, *Sticta limbata*) point together with the already known *Pseudocyphellaria aurata* to relations with comparable altitudinal ranges on other Macaronesian islands. In the cloud zone and in humid inland valleys of maritime lee regions a higher percentage of tropical geoelements has been observed, but a sociological differentiation is not yet possible. Two Cape Verdean islands show a high-montane lichen vegetation composed of

Tropical-Alpine species on exposed rock faces (e.g. *Acarospora* species) as well as of many Mediterranean species in more protected localities (e.g. *Endocarpon pusillum*, *Fulgensia subbracteata*, *Xanthoria resendei*). These calciphytic Mediterranean taxa find adequate life conditions on alkaline volcanic rocks. Because of different substrates, microclimatic and geological conditions, extrazonal lichen communities are formed. The *Stereocaulion* associations can be regarded as stages of succession on young lava streams in various altitudes.



The distribution of 'feather duster plants' ("Federbuschsträucher") in the mid-atlantic islands according to the law of 'relative habitat constancy and changing biotope' and the possibility of a forest climax in the Cape Verde Islands

Rainer LÖSCH, Kiel; Friedrich BEYHL, Eschborn; Bruno MIES, Barbara SCHWEIHOFEN, Köln

Human influences have seriously affected the natural vegetation of the mid-atlantic archipelagoes so that undisturbed vegetation may no longer occur in the Cape Verde Islands. There is particular uncertainty with respect to the natural distribution of trees. Most probably the only autochthonous tree species are *Tamarix senegalensis*, *Acacia albida*, *Ficus gnaphalocarpa*, and *Ficus capensis* in the lower regions, *Sideroxylon marmulano* and *Dracaena draco* in the mountains. Despite some local thickets of tamarisks and small groves of figs, the plant cover of the lower regions of the Cape Verde Islands may have been, at best, an open *Acacia* savannah. *Sideroxylon* and *Dracaena*

trees do not normally form forests. In their mountain habitats, at about 800 - 1200 m a.s.l., a shrub vegetation prevails, the endemic species of which have close relatives in the Canary islands and in Madeira. In the latter islands these vicariant taxa colonize the transition zone between the lower arid regions and the humid belt of the laurel forests, at 300 to 500 m and at 0 to 200 m, respectively. The genera of this scrub vegetation most often have terminal leaf rosettes on dichotomously or polytomously branched leafless stalks ("Federbuschsträucher", SCHIMPER, 1907 - literally: 'feather duster plants'). Following the law of 'relative habitat constancy and changing biotope' the altitudinal range of this vegetation depends on the latitudinal position of the respective archipelago. Hence, in the Cape Verde Islands this scrub - which is typical of the arid border of the Macaronesian forest vegetation - colonizes only the most humid tops of the mountains. These north-east facing slopes of the higher islands are just reached by the trade winds. In the lowlands the macroclimatic situation is similar to mainland Africa. That means insufficient precipitation with the result being a semidesert vegetation in the Barlovento islands, and a savannah-like vegetation in the Sotavento group. Such a grassland with scattered trees can exist, because these areas are just reached by the fringes of the equatorial low pressure cell with episodic rainfall events. The natural vegetation of the Cape Verde Islands thus parallels the situation of the African Sahel zone, but outposts of the Macaronesian "trade wind vegetation" are able to cover the mountain tops.

Bilden die Kapverden ein einheitliches Florengebiet?

F.E. BEYHL, R. LÖSCH, B. MIES & B. SCHWEIHOFFEN

As an answer to the question whether the Cape Verde Islands belong either to the Saharosindian or to the so-called "Macaronesian-Mediterranean" flower regions (i.e., either to the Saharan or to the so-called "Macaronesian" subregions, resp.), the authors suggest that these islands belong to both. The boundary between these two regions lies within the archipelago in such a way that the lower islands as well as the lower parts of the higher islands belong to the Saharosindian region, namely to the Saharan subregion (as shown by species such as *Calotropis procera*), and that the upper parts of the higher islands belong to the so-called "Macaronesian-Mediterranean" region, namely to the so-called "Macaronesian" subregion (with species such as *Euphorbia tuckeyana*). The parts of the archipelago which bear these so-called "Macaronesian" species are dispersed over several islands and may be regarded as a relict of a formerly more wide-spread distribution during a cooler climate which now survives only in these parts of the islands. The Saharosindian species are thought to have immigrated later and thereby displaced the so-called "Macaronesian" elements, in analogy to the mediterranean relict species in the upper parts of the Saharan mountains (such as *Globularia alypum*). By this reason, the Cape Verdean Islands form a transition zone between the two regions. The immigration of new species to an island or an archipelago can be described in mathematical terms using the equation systems for epidemic and diffusion processes.

Betrachtungen zu den Artenzahlen auf den Mittelatlantischen Inseln

F.E. BEYHL

For the first time, the correlation of species number S with island area F , the height h of the highest mountain and the distance D from the neighbouring continent, was studied for the East Atlantic Islands (Azores, Madeira Archipelago, Selvagens Islands, Canary Islands, Capverdean Islands) in a quantitative way by linear regression analysis. The empirical equation

$$\lg S = \text{const} + k \lg F$$

known already from other islands and archipelagos, holds also for the East Atlantic Islands, with $k = 0,351 \pm 0,181$ (as an average of 46 individual regressions). This type of correlation is valid for islands belonging to a distinct archipelago, for all East Atlantic Islands as a whole, and for the five archipelagos. Besides that, logarithms of whole area and whole species number of an archipelago fit to the regression line of the logarithms of areas and species numbers of the individual islands belonging to this archipelago as well as of those of some Mediterranean islands (Santorini, Malta, Crete and Cyprus). For these Mediterranean Islands, $k = 0,182 \pm 0,072$ (as a mean of 10 individual regressions). Only few taxonomic groups escape from linear regression analysis. Possible reasons for that behaviour are discussed. Also, the author suggests a way how to derive this equation from simple biogeographic assumptions.

The logarithms of the species numbers can also be correlated linearly to the logarithms of the maximal heights h of the islands according to

$$\lg S = \text{const} + j \lg h$$

with $j = 0,880 \pm 0,446$ as a mean of 29 single correlations.

The logarithms of the species numbers S of the East Atlantic archipelagos (except Selvagens Islands) are correlated linearly to the logarithms of the mean distances D of these archipelagos from the adjacent continent by the equation

$$\lg S = \text{const} - l \lg D$$

with $l = 0,403 \pm 0,134$ (as average of 8 individuals regressions), with the exception of the pteridophyta where species numbers are independent from the distance from continent.

The vegetation of wells in Planalto Leste, Sto. Antao

Flip HIEMSTRA, Rotterdam

The vegetation of 28 Planalto Leste wells has been described and analysed. Six species groups have been separated, whose combinations enable to distinguish two vegetation types, sub-divided into five sub-types.

The vegetation sub-types indicate a sequence from "wet" wells (with aregular water-flow) to "dry" wells (having a irregular flow).

The measured environmental factors (altitude, catchment size, climatic zone) together explain the wet to dry sequence. The environmental factors are interrelated in two ways:

- they are different measurements of either the reservoir size of the well or of the climatic of its catchment.
- they may compensate each other in their resulting action upon well flow and thus on vegetation.

Finally some thoughts are given for the use of the wells and their eventual improvement.

The Lactuceae/Compositae of the Cape Verde Islands/W-Africa

Norbert KILIAN, Berlin

A revision of the tribe Lactuceae/Compositae of the Cape Verde Islands is provided. The research bases on most specimens of all the important collections from the archipelago as well as on field studies and on material cultivated on the Botanical Garden Berlin-Dahlem. Illustrations, distribution maps and cytological data are given.

In the spontaneous vegetation of the islands the tribe which has its centre of distribution in the warm-temperate regions of the northern hemisphere is represented with 10 species. Three of them, *Sonchus oleraceus* L., *Heminthotheca echioides* (L.) HOLUB (= *Picris echioides* L.) and *Urospermum picroides* (L.) SCOP. ex F.W. SCHMIDT have to be regarded as anthropochorous as they are almost cosmopolitan weeds. No proof could be found for the record of *Leontodon taraxacoides* (VILL.) MÉRAT (= *Thrincia hispida* ROTH). Among the seven idiochorous species are five endemics and they are all woody perennials: *Launaea picridioides* (WEBB) ROBINSON, the lately described *Launaea thalassica* N. KILIAN, BROCHMANN & RUSTAN, *Tolpis farinulosa* (WEBB) SCHMIDT (= *T. glandulifera* BOLLE), *Sonchus daltonii* WEBB and a taxon known as *Sonchus gorgadensis* BOLLE. The last was only known from its description, but could be identified now with an overlooked species of the northern islands of the archipelago. Regarding their ecology the endemics can be sorted into two groups: one comprising *S. daltonii* and *T. farinulosa* is generally restricted to the humid weather side of the mountains above ca. 700 m; both taxa have close relations to the Canaries, which grow under similar climatic conditions. The other with *L. picridioides*, *L. thalassica* and *S. gorgadensis* shows an affinity to the drier slopes on the weather side below 600 m. Most lightly they are related to E-african/SW-asiatic taxa. (Probably) idiochorous are then two more *Launaea* species: the xerophytic thornshrub *L. arborescens* (BATT.) MURB. (= *L. melanostigma* PETERSON) and the polymorphic annual/biennial *L. intybacea* (JACQ. ex MURRAY) BEAUVERD, whereas the frequent records of *L. nudicaulis* (L.) HOOK. f. originate in confusion with the latter. *L. arborescens* is distributed in NW-Africa from Cap Blanc to the Mediterranean coast, in SW-Spain and on the Canaries. On the Cape Verde Island, where it grows mainly in the arid lowland

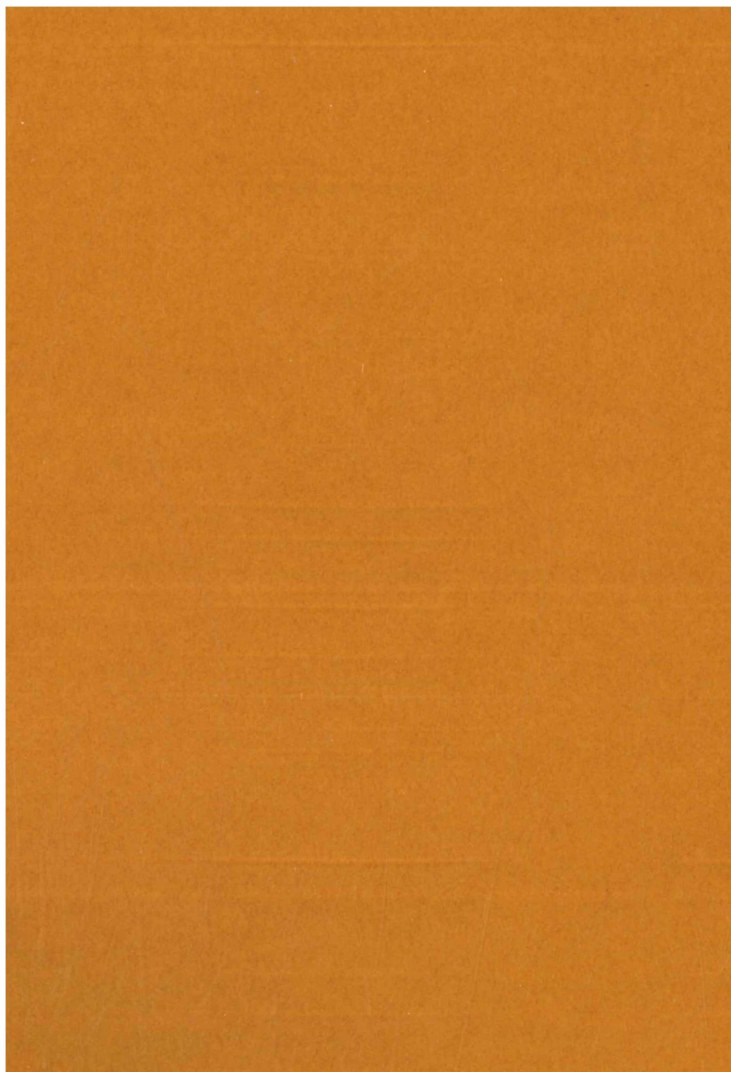
it reaches its southernmost point of distribution. *L. intybacea* is widespread in the subtropics of Africa and SW-Asia and occurs as an introduced weed also in Central America. In the archipelago it can be found from the lowland up to the higher mountains, but always avoiding rather humid climates. As cultivated species of the tribe which have not be found to be part of the spontaneous vegetation *Lactuca sativa* L., *Cichorium endivia* L. and in earlier times also *Cichorium intybus* L. are known.

Biogeography of the Cape Verde Islands

W. LOBIN, Frankfurt

In the last 8 years intensive collections of mainly phanerogams have been made in the Cape Verde Islands. For making a biogeographic survey, it was at first necessary to enlarge the floristic knowledge. At second taxonomic treatments had to be carried out. At third the phanerogamic flora had to be classified into groups of their origin: 42,0 % of the species are introduced by human activities, 27,6 % are so far regarded as belonging to the natural vegetation, 30,2 % could not been placed in either one of the groups. The last group has been subdivided into species most probably introduced by man, species most probably belonging to the natural vegetation and uncertain species. All species of the natural vegetation, or of probably belonging to it and the uncertain species have been included into the present study (206 species). The analysis has been undertaken separatly for the ferns, the endemic and the non-endemic species.





ZOBODAT - www.zobodat.at

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Zoologisches Museum der Christian-Albrechts-Universität Kiel: Arbeitsblätter](#)

Jahr/Year: 1987

Band/Volume: [16](#)

Autor(en)/Author(s): diverse

Artikel/Article: [4. Symposium Fauna und Flora der Kapverdischen Inseln. Kiel, 8. - 10. Oktober 1987. Abstracts — Englische Kurzfassung der Vorträge — 1-32](#)