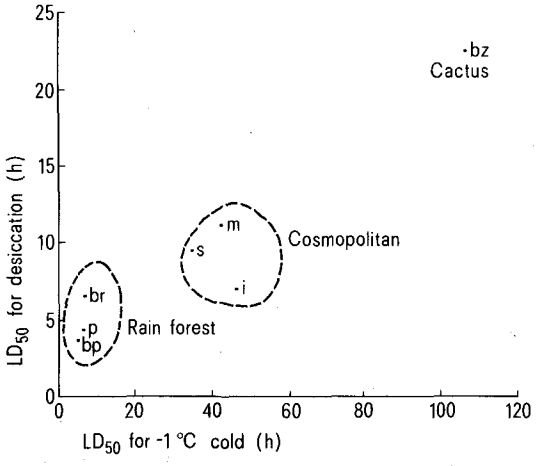
can be readily collected in mid-winter in Victoria but not the sibling species[7], conversely the sibling species both occur in the heat stressful urban regions of tropical north Queensland but not apparently *D. immigrans*[8]. These and other observations[9] show that the effects of the stresses under discussion can be *directly* related to species continuity in nature. This is reasonable, since insects such as cosmopolitan *Drosophila* species are presumably subject to r-selection rather than K-selection so that mortalities are expected to be largely density-independent, nondirected, and directly relatable to variations of the physical environment[7,10].

2 endemic species (*D. bipectinata* and *D. birchii*) from the rain forests of the humid tropics of north Queensland and *D. paulistorum* from the rain forests of tropical America[11] are extremely sensitive to environmental extremes by comparison with the cosmopolitan species (figure). This is predictable given the small seasonal and diurnal climatic (temperature) changes in tropical rain forests compared with those in the temperate climate of Victoria. We conclude that natural selection has built up high levels of physiological tolerance to temperature/desiccation stresses in temperate region cosmopolitan *Drosophila* species. Indeed there is direct evidence for natural selection from demonstrated interpopulation variability for tolerance to these stresses in *D. melanogaster* and *D. simulans* which is directly relatable to habitats[5,6] in eastern Australia (as well as from analogous results for the Queensland fruit fly, *Dacus tryoni*, which occurs over a wide latitudinal range of eastern Australia[12]).



LD_{50} values expressed as number of h at which 50% of flies died for desiccation and −1 °C stress plotted against each other for various *Drosophila* species: bp, *bipectinata;* br, *birchii;* bz, *buzzatii;* i, *immigrans;* m, *melanogaster;* p, *paulistorum;* s, *simulans.* The *D. paulistorum* results are for the mean of 2 semi-species, 1 transitional and 1 Andean[11], which were combined being very similar. In general males were more sensitive to stresses than females as expected[5], but sexes were combined since no large sex × species interactions were detected.

Assuming that tolerance to these stresses is relatable to intensities of natural selection, the extreme tolerance of an introduced species (to Australia) *D. buzzatii* (figure), which originated in Argentina in association with 1 or more species of the cactus genus *Opuntia* is predictable, since its only known breeding sites are rot pockets in the cactus itself[13]. This absolute association in nature means that flies are far less able to avoid environmental extremes by habitat selection than cosmopolitan species, and so there would necessarily be extremely intense natural selection for resistance to environmental extremes in this species simply because of the highly specific nature of resources utilized. High tolerances to environmental extremes may also be adaptive in such species, where migration to new exposed rot pockets is necessary for species continuity. The figure clearly shows the contrast between the 3 groups of species according to the ecological categories of tropical rain forest species, cosmopolitan species and cactus species.

In conclusion, cosmopolitan *Drosophila* species can tolerate reasonably wide desiccation/temperature extremes and utilize generalist resources. Cosmopolitan species do not appear to have unique genetic features, but may have genotypes capable of adapting to greater environmental extremes than tropical rain forest endemics at least. This does not preclude certain species being highly resistant to stresses, but this is likely to be associated with more specialist resource utilization as in *D. buzzatii.*

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Prostaglandin-like substances in *Propionibacterium acnes*

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Summary. The presence of prostaglandin-like substances in *Propionibacterium acnes* is reported for the first time.

The factors responsible for inflammatory reactions in acne vulgaris are not yet completely understood. The rupture of the comedone wall results in a leakage of the intrafollicular content into surrounding dermis, which elicits the inflammatory response. The *Propionibacterium acnes* is considered to be a substantial source of intrafollicular lipases[1] and to mediate the lipolysis of sebaceous triglycerides to comedogenic fatty acids[2]. Recently, it was stated that hyaluronidase is able to decompose the intracellular material of the pilosebaceous duct wall, and in this way facilitate the

release of fatty acid into the perifollicular area[3]. However, this still ignores the complexity of the pilosebaceous duct microenvironment with its particular microbial flora and specific metabolites, which may be involved in the inflammatory skin reactions around acne lesions. Therefore, the existence of other casual agents of inflammation is suggested.

Prostaglandins – members of a new hormonal system – can exert marked effects on various important physiologic processes and act as regulators of cell function[4]. During recent years, their involvement in inflammatory skin reactions has been recognized. Prostaglandins participate in the development of various inflammatory skin disorders e.g. primary irritant dermatitis[5], allergic contact dermatitis[6] or erythema induced by UV-light radiation[7]. Our work aims to clarify whether prostaglandins participate as potential terminal inflammatory mediators in acne vulgaris.

P. acnes strains were subcultured under both aerobic and anaerobic conditions on artificial agar for about a week. The strains were then carefully removed from the dishes, immediately transferred to cold ethanol and stored at −20 °C under nitrogen until analysis. An improved extraction procedure was performed. Ethanol was evaporated under reduced pressure, the samples, after addition of water, were acidified to pH 3 and extracted 3–6 times with ethyl acetate. The final ethyl acetate fraction was washed with a small amount of water until neutral reaction and concentrated under nitrogen. The total lipid extracts were further purified by column chromatography and TLC[8–10]. The extracts and eluates were always compared with reference samples of PGE_2.

Our analysis revealed the presence of prostaglandin-like substances of E-type in the lipid fraction of *P. acnes*. Prostaglandin precursor, as arachidonic acid, has been demonstrated in protozoa, algae and mosses and γ-linolenic acid in fungi and flagellates[11], but to our knowledge the occurrence of prostaglandins in microorganisms has not been reported before. Our results support the idea that prostaglandins have a direct effect on the target tissues. According to the current concept, the principal effect of E-prostaglandins appears to be on adenyl cyclase, the enzyme responsible for synthesis of cyclic adenosine monophosphate (cAMP) from adenosine triphosphate (ATP). The lipid fraction of *P. acnes* possesses an important stimulatory effect on ovarian cAMP (unpublished data). Moreover, this fraction manifested also a potent biological activity of PGE type using smooth muscle strips from human oviduct (unpublished data) as well as on gerbil colon (unpublished data). Lately, these compounds has been shown to elicit a PGE-like response in hamster cheek pouch vessels (unpublished data). Consequently, prostaglandin-like substances of E-type produced by *P. acnes* might be released extracellularily and act on the epidermal cell receptors of the follicular orificium.

It is evident that an acne lesion is associated with several interrelated factors, where *P. acnes* metabolites seems to gain a profound clinical significance. Our findings may add a new dimension to the understanding of the inflammatory process in acne vulgaris, and perhaps even to inflammatory reactions caused by other pathogenic bacteria, virus or fungi containing intracellular prostaglandin-like substances.

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White leaf disease of *Cynodon dactylon* Pers., a mycoplasmal disease in India

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Summary. White leaf disease of Bermuda grass (*Cynodon dactylon* Pers.) has been reported from a few countries to be caused by a mycoplasma-like organism. We have tried to observe the causal agent in white leaf diseased plants of *C. dactylon* collected near Varanasi. Both tetracycline treatment and electron microscopy have revealed the presence of mycoplasma-like bodies in phloem cells of the diseased plants.

White leaf disease of the Bermuda grass (*Cynodon dactylon* Pers.) has been observed in the field for the last several decades (figure 1). It was thought formerly that the white variety is probably a diseased state of the plant, without assigning any scientific reason[2]. A suspected virus causing similar symptoms was also reported on this host by Slykhuis[3]. Chen et al.[4] and Joseph et al.[5] detected mycoplasma-like bodies in the sieve tube of white-leaved Bermuda grasses under electron microscope. They also got positive results with tetracycline treatment. The present studies were made to find out whether the material from Varanasi contained the same organism.

Material and methods. Tetracycline treatment: The diseased plants were uprooted and their roots were thoroughly washed in running distilled water. Tetracycline hydrochloride was dissolved in sterilized distilled water in various concentrations. The roots of the diseased plant samples were dipped in such solutions for 24 h and washed again in running distilled water. Such treated plants, in groups of 5, were planted in earthen pots containing sterilized soil and observed for the remission of disease symptoms.

Penicillin treatment: Treatment with penicillin G was carried out in accordance with the tetracycline treatment. A set of 5 healthy plants were also treated with tetracycline hydrochloride and penicillin G separately which served as controls.