Studies on Pathogenicity of Klebsiella and Erwinia

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Several species of microorganism have been shown to be pathogenic for both plants and warmblooded animals. The morphological similarities between bacteria of the genus **Klebsiella** and the genus **Erwinia,** which comprises plant pathogens, led to a study of the interrelationships between the two groups.

Sixteen strains of **Klebsiella** isolated from hospital patients and eight strains of **Erwinia** originally recovered from infected plants were investigated with respect to pathogenicity for animal and plant tissues.

The tests for plant pathogenicity were all carried out in collaboration with Dr. Philip White. Several methods of approach were employed. A - Sterile slices of carrot were inoculated with each strain of organism. Several organisms of both plant and animal origin were able to inhibit normal callus formation and even to lyse the carrot tissue. B - Sunflower seedlings were grown out of doors and inoculated, when several inches high, with young cultures of each organism, which had recently been subjected in the laboratory to repeated passage at room temperature. A culture of **Phytomonas tumefaciens,** a tumor producing bacterium, was used as a control on the method of inoculation. Whereas the seedlings inoculated with **Phytomonas** developed tumors as a result of infection, none of the seedlings inoculated with either **Erwinia** or **Klebsiella** showed any change as a result of inoculation with these organisms. C - Carrot tissues, previously carried in culture in Dr. White's laboratory for many passages, displayed no clearcut signs of infection as a result of inoculation with the organisms under study.

In the tests for mouse pathogenicity, we used several strains of mice from the Jackson Laboratory. The following strains were selected with the help of Dr. Carl Ten Broeck of that laboratory, as likely to differ from each other in their response to infection: C 3 H, C 57 (brown) and Princeton. The bacterial cultures were given several rapid passages at 37°C before inoculation; the final suspension was standardized in the Coleman spectrophotometer. The intraperitoneal and intranasal routes of inoculation were compared. Mice of the C 3 H and Princeton strains appeared to be more susceptible to infection than the C 57 (brown), and the intranasal route was the more satisfactory. The majority of the **Klebsiella**

strains produced pulmonary lesions in mice, whether inoculated intranasally or intraperitoneally. **Erwinia** strains at the same dilution rarely did so; if, however, larger numbers of organisms were employed in the inoculum, many strains of **Erwinia** were capable of inducing pneumonia in mice.

These data suggest that **Klebsiella** and **Erwinia,** both widely distributed in nature, may, depending on circumstances, shift from plant to animal hosts and possibly vice versa.

Studies on the Tubular Excretion of Creatinine and P-Aminohippurate in Thin Slices of Dogfish Kidney (Squalus acanthias)*

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Studies on the metabolic processes associated with active cellular transport have been greatly facilitated by the recent development of a variety of experimental techniques utilizing either isolated renal tubules or thin slices of kidney cortex[1]. The transport and accumulation of colored compounds, such as phenol red, can be visualized directly with the microscope. The movement of other compounds, such as p-aminohippurate (PAH) or diodrast, can be followed quantitatively by chemical analyses of the tissue and ambient fluid. The **in vitro** techniques provide a convenient method for examining various metabolic intermediates and inhibitors for their effects on renal transport mechanisms.

In the present studies, the slice technique was used for observations on the tubular excretion of creatinine and PAH in the dogfish, Squalus acanthias. This species was selected for study because of the relatively high creatinine/inulin clearance ratios reported by Shannon[2]. The clearance data in Squalus indicate that, at low plasma levels of creatinine, tubular excretion accounts for 75 per cent or more of the urinary creatinine.

*This work was supported in part by grants from the Rockefeller Foundation to John V. Taggart and Roy P. Forster.