Bulbus olfactorius. Ein Zusammenhang mit dieser Tätigkeit konnte ausgeschlossen werden. Auch war keine Beziehung zur Atemfrequenz festzustellen.

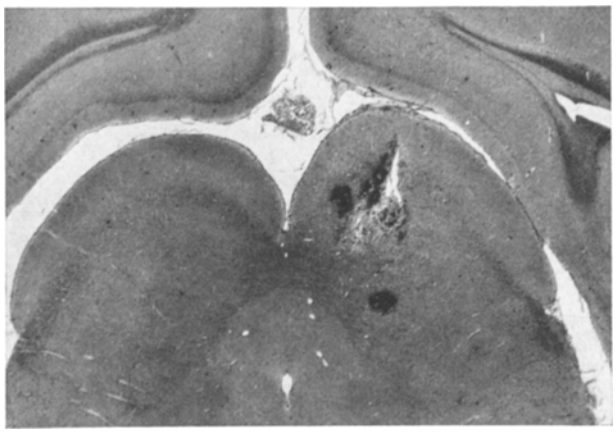

Fig. 2. Elektrodenlage bei Kaninchen 2 (Nissl, × 14).

Die Amplitude der Bursts nimmt mit dem Alter zu: Während bei den jüngsten Tieren Amplituden (unipolar) von 20–50 μV gemessen wurden, traten bei den ältesten solche bis 260 μV auf.

In zwei akuten Versuchen konnte diese Tätigkeit nicht beobachtet werden.

Es handelt sich allem Anschein nach um eine Tätigkeit, die in der mesenzephalen Formatio reticularis entsteht (Figur 2) und die besonders dann zustande kommt, wenn das Tier emotionell gestört wird.

Summary. In the mesencephalon of young rabbits (11–45 days old), a distinct pattern could be elicited by emotional activation: it consists of high-frequency bursts (48–70 c/sec, duration up to 150 msec), superimposed on phase-locked slow waves.

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Neurologisches Institut der Universität, Wien (Österreich), 23. März 1966.

The Effect of Leafhopper Infestation on the Respiration of Castor Bean Varieties in Relation to their Resistance to *Empoasca flavescens* (F.) (Homoptera: Jassidae)

Many leafhopper species have been proved to cause typical phytotoxemia injuries called 'hopperburn'. The influence of such an injury on the physiology of the plant, with particular emphasis on the plant resistance to insects, is not adequately known so far. In the present study, selected castor bean (*Ricinus communis* L.) varieties earlier proved to be resistant, tolerant and susceptible to the attack of the jassid, *Empoasca flavescens* (F.)[1], were used to explore the effect of leafhopper infestation on the plant respiration.

The three selected varieties, Dominica, C3. Pakistan, and R.C. 1098 Baker, represented respectively the susceptible, tolerant and resistant types of castor bean. Leafhoppers were introduced into the chamber containing the potted plants and the study was carried out under insectary conditions with the temperature ranging from 21 to 24 °C and humidity at 80% maintained by evaporative air coolers. The diffused natural light inside the insectary was supplemented by providing a number of fluorescent lamps of intensity up to 160 W for 10–12 h a day. Plant respiration was measured by estimating the amount of oxygen uptake in the healthy and infested leaves using a Warburg apparatus (Precision Scientific Co.). 25 leaf discs from the samples, each of 3 mm diameter, were used and the experiment was conducted in complete darkness in a water bath kept at 30 °C.

The results presented in the Table show that the rate of respiration of the jassid-free plants of the C3. Pakistan and Dominica varieties were markedly higher than that of the resistant R.C. 1098 Baker variety. The infested plants, in general, respired more than the healthy plants. Despite the fact that there is no statistically significant interaction between the healthy vs. infested and the different varieties, there was a definite tendency towards increased respiration to the extent of 44.0% in the injured susceptible plant as against an increase of only 11.6 and 3.7% in the tolerant and resistant varieties respectively.

The increased oxygen uptake may be attributed to the fact that normal physiological processes, like carbohydrate and protein synthesis, are interfered with as a result of jassid injury. The tolerant and resistant varieties apparently tolerate the injury without much increase in respiration. Increased respiration in plants affected by Hemiptera, particularly aphids, has been reported by Kloft[2], who observed that attack by *Quadraspidiotus*

Effect of jassid feeding on the respiration of castor bean varieties

Variety	Oxygen uptake µl/h/g			% Increase in infested plants
	Healthy	Infested	Mean	
(1) Dominica (susceptible)	2930	4223	3576	44.0
(2) C3. Pakistan (tolerant)	4458	4978	4718	11.6
(3) R.C. 1098 Baker (resistant)	2650	2747	2698	3.7
Mean	3346	3983		19.0

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perniciosus (Comst.) tripled the oxygen consumption of plants. Similarly, LADD and RAWLINS[3] also noted increases in respiration in the potato plant as a result of the feeding of the leafhopper, *Empoasca fabae* (Harr.)

The increased respiratory rate in plants always coincides with the increased protein synthesis[4]. This has proved true in the case of the susceptible variety Dominica, where jassid injury has invariably been followed by increase of total nitrogen content and total amino acid content[5]. This phenomenon may be explained in the light of the results of SPIEGELMAN et al.[6]. The required energy for the increased rate of protein synthesis is provided by enhanced rate of respiration. STEWARD et al.[7] and JAMES[8] also reported that increased respiration results in increased protein synthesis in plants.

In the plants of Dominica variety injured by hopperburn, a high accumulation of sucrose was observed[5]. The sucrose content and respiration, sucrose content and total nitrogen, and total nitrogen and respiration were all positively correlated. This is in conformity with the observations made by RICHARDS[9] on barley.

Zusammenfassung. Die Saugtätigkeit der Jasside *Empoasca flavescens* (F.) führte zu einer um 44% gesteigerten Respiration von geschädigten, anfälligen Rizinuspflanzen (*Ricinus communis* L.) im Vergleich zu 11.6% und 3.7% bei Pflanzen einer toleranten und resistenten Sorte. Diese Zunahme war bei der anfälligen Sorte verknüpft mit einer gesteigerten Anhäufung von Rohrzucker, Gesamtstickstoff und Gesamtaminosäuregehalt.

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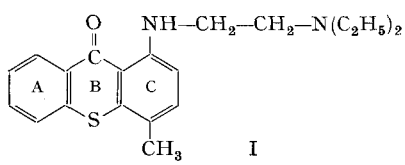
Antagonism of Heterocyclic Sulphonamides to the Schistosomicidal Effect of Lucanthone

The schistosomicidal[1] and antineoplastic[2] activity of lucanthone (Miracil D) (I) lies in ring C, where a methyl group is located in a position para to a substituted amino, i.e. a *p*-toluidine system. This reactive system, resulting from the high electron density in ring B, was found to undergo oxidation with hydrogen peroxide through the catalytic effect of peroxidase. Ring C thus became quinoid and was accompanied by the oxidation of the sulphur atom to the sulphone[3]. Other reactions have confirmed the fact that the position of the methyl group makes it very labile[4].



I

Heterocyclic sulphonamides have been found to inhibit the action of peroxidase on the oxidation of aromatic amines by the system peroxidase-hydrogen peroxide[5]. Also, the oxidation of *p*-aminobenzoic acid by peroxidase is inhibited by the presence of sulphonamide[6]. Further, heterocyclic sulphonamides inhibit the antitumour effect of colchicine[7].

These facts induced us to investigate the effect of heterocyclic sulphonamides on the schistosomicidal activity of lucanthone. Three members of this group were chosen, namely sulphathiazole, sulphamethazine and sulphadiazine. Experiments were carried out on mice infected with *Schistosoma mansoni*. In vitro studies will be reported later.

The curative dose of lucanthone is 5 mg/kg twice daily[8]. In our experiments, 20 mg/kg twice daily was administered to infected mice; some of which were treated with lucanthone alone, while the others, divided into 3 subgroups, were administered sulphamethazine, sulphadiazine and sulphathiazole in solution, in an equimolecular dose to lucanthone.

Experimental. Mice weighing between 20 and 35 g were exposed to infection with *Schistosoma mansoni*, using cercaria liberated from various snails. More than one snail was used as a source of infection, since it had been noticed that usually infection originating from one snail gave a unisexual adult infection. For infection, each animal was partially submerged in a 1 l beaker covered with wire

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