rear (α) side and, as the absolute configuration and geometry of the ethylidene double bond of akuammicine (IIa) have been established by correlation[4a] with a degradation product[10] of strychnine, the glycol derived from akuammicine (IIa) must have the stereochemistry IIb. The absolute stereoformula IIc, therefore, follows automatically for compactinervine[11].

Zusammenfassung. Es wird über die Isolierung eines neuen Alkaloids – Compactinervin – aus der brasilianischen Apocynaceen-Art *Aspidosperma compactinervium* Kuhlm. berichtet. Durch massenspektroskopische und Kernresonanz-Messungen und chemische Umwandlungen konnte gezeigt werden, dass es sich beim Compactinervin um 19,20-Dihydroxy-19,20-dihydro-akuammicin handelt. Seine vollständige Stereochemie sowie die des verwandten Alkaloids Lochneridin konnte abgeleitet werden. Compactinervin stellt die erste Verbindung vom Akuammicin-Typ dar, die aus einer *Aspidosperma*-Art isoliert worden ist.

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[11] All substances in this communication gave correct mass spectrometrically determined molecular ion peaks, which in many instances were confirmed by elementary analyses performed by Messrs. E. Meier and J. Consul. We are indebted to Prof. J. LeMen (Faculté de Pharmacie, Paris) for a generous sample of akuammicine and to Dr. L. J. Durham for the n.m.r. spectral measurements.

Erythrocyte Catalase in Liver Cirrhosis and in Experimental Liver Injury

The behaviour of erythrocyte catalase activity in liver diseases is not well known. Jonderko[1] and Killar[2] ascertained the decrease of this enzyme activity in viral hepatitis. Iagnov[3,4] obtained similar results in liver cirrhosis, heart failure and viral hepatitis. The purpose of the present work was to investigate the behaviour of erythrocyte catalase activity in patients with cirrhosis of the liver, and in dogs with experimental chronic liver injury.

Erythrocyte catalase activity was determined by Jolles method, modified by Summer and Dounce[5], washed erythrocytes or hemolysed whole blood were used. Erythrocyte catalase activity was given as mean K_s obtained from 2 tests performed in parallel in 3 intervals of time. The enzyme activity in patients was expressed per μl of erythrocytes. Oxalate or citrate was used to prevent clotting. Blood was kept at 4°C. Determinations were made the same day blood was taken. Erythrocyte catalase activity in dogs was expressed per 20 μl of erythrocytes. Serum glutamate-oxaloacetic transaminase (SGOT) and serum glutamate-pyruvic transaminase (SGPT) were determined according to Umbreit et al.[6]. Experimental liver injury in dogs was caused by a long-term administration of carbon tetrachloride, 0.5 ml/kg twice a week for 42 days with aid of a gastric tube[7]. Blood was taken from dogs, from vena saphena posterior 4 times: before intoxication and 14, 28 and 42 days afterwards. Carbon tetrachloride (5 ml/kg of body weight) administered for two successive days, caused an acute intoxication in dogs. For each experiment 6 dogs were used, one of them being the control. Blood was taken 24 h after intoxication.

The diagnosis in patients was based on laboratory investigations and clinical observation; in separate cases, on autopsy and laparascopy. The diagnosis in dogs was based on laboratory investigations (SGOT and SGPT determinations) and autopsy data. 13 patients with liver cirrhosis, due to different reasons, were examined. Significant decrease of erythrocyte catalase activity was found in all cases. In individual cases these values were between 38.6 and 82.0% of normal, averaging 59%. Simultaneously, hemoglobin and the number of erythrocytes were determined; significant deviation from normal values was not observed (Table).

In experimental chronic liver injury in dogs, erythrocytes catalase activity decreased to 24.6% of normal (range = 18–30%). However, hemoglobin and the number of erythrocytes remained constant. A considerable increase of SGOT and SGPT was simultaneously observed (Figure 1). Control dogs did not show deviation from initial values. In acute intoxication with CCl_4, mean decrease of erythrocyte catalase activity was 56% of normal value, ranging between 35 and 69% of normal. Hemoglobin and the number of erythrocytes did not alter. A significant SGOT and SGPT increase was ascertained. Results are given in Figure 2. Corresponding results in the control dog did not change with respect to the initial values.

Erythrocytes catalase activity in normal human subjects and in patients with liver cirrhosis

Human subjects	Number of cases	Catalase activity units per 1 μl of erythrocytes	Hemoglobin g%	Erythrocytes millions per mm³
I Normal	20	951 ± 104	13.7	4,28
II Liver cirrhosis	13	566 ± 121	12.0	3,91

I and II: $t = 9.688$; $p > 0.001$

[1] G. Jonderko and M. Buczkowski, Polskie Archiwum Medycyny Wewnętrznej, Warsaw *1*, 21 (1961).
[2] M. Killar, Roczniki Akademii Medycznej, Bialystok, in print.
[3] S. Iagnov, Acta med. Acad. scient. Hung. *10*, 183 (1957).
[4] S. Iagnov, Viata Medica *4*, 43 (1957).
[5] S. Jolles, in S. P. Colowick and N. O. Kaplan, *Methods in Enzymology* (Acad. Press, New York 1955), vol. 2, p. 780.
[6] W. W. Umbreit, G. R. Kingsley, R. R. Schaffert, and H. Spilet, J. lab. clin. Med. *49*, 455 (1957).
[7] N. W. Łazarowa, Wywoływanie chorób u zwierząt dla badań doświadczalno-leczniczych, Państwowe Zakłady Wydawnictw Naukowych (Warsaw 1957), p. 309.

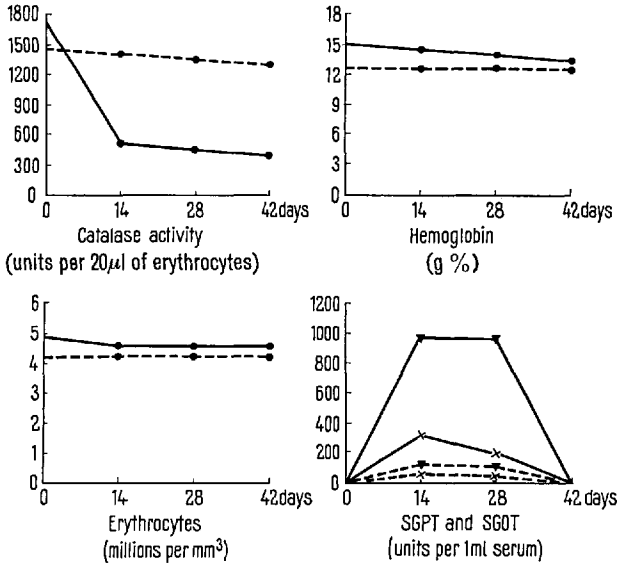

Fig. 1. Erythrocytes catalase activity as compared with other changes in dog blood in the course of chronic liver poisoning. Solid line = intoxicated dogs. Broken line = control dogs. ▽-▽-▽ SGTP activity. ×-×-× SGOT activity.

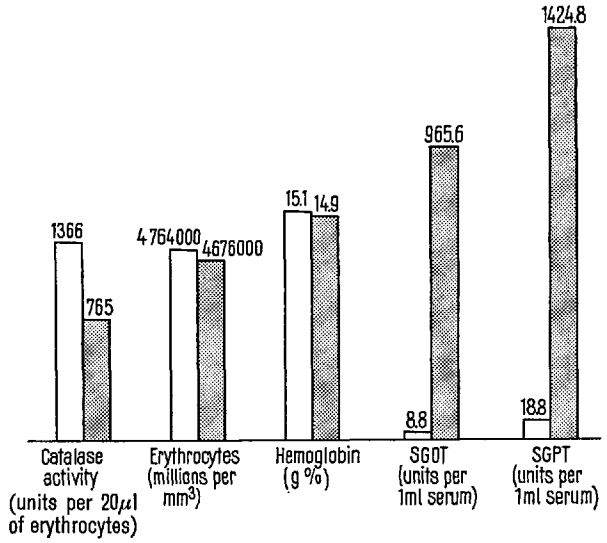

Fig. 2. Erythrocytes catalase activity as compared with other changes in dog's blood in the course of acute liver poisoning. White columns = values before liver injury, black columns = values after poisoning.

DIOGUARDI[8] recently revealed that the activity of a great number of enzymes in erythrocytes may vary in larger limits in people with liver diseases than in healthy subjects. Moreover, in this author's opinion, adenosine triphosphate (ATP) concentration in erythrocytes decreases in liver diseases.

The results presented indicate a relationship between liver function and erythrocyte catalase activity. Further investigations, however, are needed in order to elucidate the role of the liver in the biosynthesis of this enzyme[9].

Résumé. Nous avons trouvé que l'activité de la catalase des erythrocytes chez les cirrhotiques et chez les chiens intoxiqués par CCl_4 est considérablement diminuée, tandis que le numéro globulaire et le taux d'hémoglobine ne représentent que des changements très peu signicatifs.

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[8] N. DIOGUARDI, Europ. Symp. med. Enzymol. (Milano 1960), Proc. (Karger, Basel-New York 1961), p. 234.

[9] *Acknowledgments.* The author is indebted to L. JAROSZEWICZ, who kindly performed transaminase determination, and to L. REJNIAK (Department of Pathological Anatomy) for his help in the evaluation of autopsy data.

Distribution of Antibiotic-Producing Actinomycetes in Danish Soils

This paper reports results obtained in a study of the antibiotic activity displayed by 660 strains of the genus *Streptomyces* isolated from Danish soils.

Experimental Methods. Soil samples: Soil samples were collected at depths not exceeding 10 cm in 19 localities of uncultivated soil and other natural habitats in Denmark (Table I).

Media: A composite synthetic medium was used for the isolation – dextrose 5 g, soluble starch 1 g, glycerol 4 g, casein 1 g, asparagin 1 g, yeast-extract (Difco) 0.5 g, dibasic potassium phosphate 2 g, sodium chloride 1 g, sodium nitrate 1 g, magnesium sulphate ($7H_2O$) 1 g, calcium carbonate 0.5 g, agar (Difco) 16 g, tap water 1000 ml – adjusted to pH 7.0 after autoclaving (121°C/20 min).

For the maintenance of the cultures a potato-dextrose agar medium with 0.5% peptone was used (pH 7.0 after sterilization). A heart infusion-peptone-yeast-extract agar, pH 7.2 (after BELCOVE and SANTOW[1]), was used for the agar tests against bacteria, and for the anti-fungal analysis a dextrose-peptone-yeast-extract agar (pH 6.8).

Test organisms: In the antibacterial analysis, the main test organism was *Staphylococcus aureus* (strain 209 p) and in the antifungal tests *Saccharomyces ellipsoideus*. Other test organisms were *Bacillus subtilis, Mycobacterium phlei, Escherichia coli* and *Aspergillus niger.*

Isolation of strains of Streptomyces: Vegetation, withered leaves and stones were removed from the collecting place. The soil samples were taken aseptically. The pH of the soil was measured electrometrically. The water content of the samples was determined by drying 10 g of the soil at 98°C for 24 h. The soil was plated out as soon as possible after sampling, most often on the same day. The standard dilutions for plating-out of the soil samples were 1:250000, 1:500000 and 1:1000000. To the first flask of dilution, one drop of Tween 80 was added and so many

[1] A. S. BELCOVE and S. SANTOW, Antibiotics and Chemotherapy 6, 585 (1956).