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Constriction of airways by cotton bract extracts.

Byssinosis is an occupational lung disease of cotton and other textile workers. Cotton dust originated from the bracts, provokes airway constriction. Bracts are the leaf-like structures subtending the cotton boll. The aim of our research was to isolate the component from the bracts that is responsible for the byssinosis symptoms and to elucidate its chemical structure. Crude and purified extracts were tested for their constrictor activity by a provocation test. An aqueous extract is vaporized into a mist of inhalable droplet size by use of a nebulizer. Healthy volunteers inhale this mist for 10 minutes at each session. Bronchial constriction was derived from flow-volume curves. The decrease of the maximum expiratory flow at 40% of lung capacity was measured (MEF 40%). The 40% volume is chosen in the decreasing branch of the flow-volume curve, which is exercise-independent. Among 105 healthy volunteers 67 persons responded with a decrease of 25% or more of MEF 40% on first time exposure to a crude extract from 1 gr of bracts (1). Purification was performed resp. by removal of proteins by precipitation with methanol, by anion exchange chromatography and by paperchromatography. By paperchromatography in propanol-1: ammonia:water (6:3:1) we isolated five components characterized by the Rf values 0.66, 0.55, 0.39, 0.22, 0.08. Biological activity could be demonstrated in the second compound. Element analysis yielded a ratio of C:H:N:O as 1.00:5.4:0.90:0.52. This corresponds to a molecular formula of $(C_2 H_{11} N_2 O)_n$, whereas n may vary from 2 to 12. Supplementary information from break-down reactions will be shown. The airway constrictor agent may cause a non-antigenic release of histamine. Without prior sensitization extracts of bracts release histamine from human lung tissue in vitro (2).

- 1) M.G. Buck and A. Bouhuys. Proceedings of 4th Beltwide Cotton production research conferences, St Louis, Missouri, pp 31-34, (1980).
- 2) Nicholls, P.J., Nicholls, G.R., Bouhuys, A. In: Inhaled particles and vapours II (C.N. Davies ed.) London, Pergamon Press. pp 69-74, (1966).

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Pro-opiomelanocortin and neurohypophyseal peptidergic pathways in the brain

Since the idea of Collin (1928) that adenohipophyseal substances would be transported via the intermediate lobe and the neurohypophysis into the brain, the pituitary is always referred to as a possible source of demonstrable amounts of neurohypophyseal hormones or α -MSH, ACTH and related peptides in extrahypothalamic or hypothalamic brain regions. However, evidence is rapidly accumulating that, more likely than a pituitary origin the presence of these peptides in the brain can be explained by their occurrence in a vast network of fibres distributed over a wide variety of regions in the brain. Immunocytochemical observations demonstrated that opiomelanocortin peptides are present in neurons of the arcuate nucleus and in pathways running from this nucleus to the limbic system, midbrain and hindbrain (Swaab et al., 1981). Vasopressin (AVP) and oxytocin (OXT) are synthesized in the paraventricular (PVN), supraoptic and suprachiasmatic nucleus (SCN) (AVP only) and transported via extensive pathways either towards the neurohypophysis or to various brain regions. AVP fibres from the SCN terminate mainly in the limbic system, among which in the lateral septum in a sex-dependent way. AVP and OXT fibres from the PVN reach the hindbrain regions and spinal cord. It has been demonstrated that these fibres terminate synaptically on neuronal dendrites and cell bodies. Morphologically these synapses are undistinguishable from the classical aminergic neurotransmitter containing synapses. These results and the dense peptidergic innervation of various brain regions suggest that the neuropeptides form a new class of neurotransmitters in the brain and that they are involved in various central processes.

Collin, R., Arch. Morph. Gen. Exp. 28, 102

Swaab, D.F. et al. in: Endogenous peptides and learning and memory processes (in press, 1981)