with confusion (sleep terrors) or with a vegetative expression (nocturnal enuresis).

Furthermore polygraphic recordings have pointed out that these episodic phenomena of sleep have no relation to epilepsy. EEG tracings show an alpha rhythm and never indicate paroxysmal discharges. However, association with epilepsy is possible and we once observed a grand-mal seizure immediately after a sleep terror[14]. Night incidents, especially in the child, are minor and easily corrected by mild tranquilizers.

Night epilepsy

Recent studies have shed light on the influence of the 2 kinds of sleep and on the patterns of attacks which occur during the night[15].

NREM sleep is a genuine convulsant agent. It facilitates the generalization of discharges and generalized as well as partial attacks occur during this kind of sleep. It modifies the electrical and clinical pattern of attacks. It facilitates tonic attacks, the duration of which can be between 5 and 50 sec, and the number of which can vary from 10 to 300 within a single night. Clinical features are extremely variable, from grand-mal attacks to minor phenomena such as moaning or teeth grinding. This activation of epilepsy by NREM sleep may depend upon the synchronizing mechanisms of this kind of sleep. On the other hand the short duration of tonic attacks without any post-ictal phenomena favours an inhibition associated with the facilitation induced by NREM sleep.

REM sleep reduces generalized discharges. It can be the time when frontal lobe or temporal lobe partial attacks occur; the electrical pattern of these attacks looks like that of daytime attacks though their clinical features may be tenuous. In addition petit-mal paroxysmal discharges similar to that of wakefulness are encountered during REM sleep.

Transitional periods between wakefulness and NREM sleep stage I or between sleep and wakefulness (awakenings during the night, morning awakening) are elective phases for the appearance of centrencephalic epilepsies such as petit-mal, myoclonic petit-mal, grand-mal. The functional reorganization of the brain during transitional states of alertness clearly facilitates these epilepsies.

Sleep stage patterns are modified by grand-mal attacks; REM sleep duration is reduced. On the other hand, tonic attacks, partial attacks, whether in NREM sleep or in REM sleep, do not alter the organization of sleep.

Other current research concerns the anomalies of sleep in mental diseases, in heart, vascular and endocrine disorders and in degenerative diseases of the central nervous system. The study of sleep, which in man takes up a third of his life, is only in its early stages. It is likely that new data will be obtained by studying sleep and it can be considered as a tool, for a better knowledge of numerous diseases, and maybe, their physiopathology.

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10. Conclusion. Sleep as part of the integral circadian waking-sleep function

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Confusion about 'what sleep actually is' occurs when complementary events, such as day and night, waking state and sleep are dissociated. Thus, when the waking state is disregarded, the meaning of sleep cannot be satisfactorily comprehended. Consequently, the techniques are arbitrarily focused on sleep alone; this automatically falsifies the functional interpretation of the experimental results. In order to avoid such misinterpretations, we should consider the whole waking-sleep cycle in relation to the circadian (circa 24-h) biorhythm, and within the latter, consider separately the diurnal (day-light) 12-h phase and the nocturnal (night-dark) 12-h phase. Only the full power spectrum of the telemetrically recorded EEG, con-

currently with the quantitative analysis of the behavioral somato-motor and viscero-motor manifestations, can provide a complete picture of the interacting waking and sleep processes, in animals and man. This concept of an integral waking-sleep function and the use of highly elaborated techniques will allow a functional understanding of wakefulness and of the corresponding complementary sleep function.

All co-authors of this survey deserve full credit and gratitude for having summarized the chief aspects of sleep and expressed their personal conception.

SPECIALIA

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Structure of effusol: A new phenolic constituent from *Juncus effusus*

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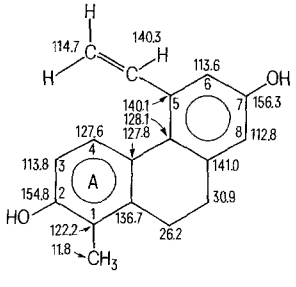
Summary. Effusol, a relatively rare alkylated phenolic 9,10-dihydrophenanthrene has been isolated from *Juncus effusus*. Its structure has been established mainly on the basis of ^1H and ^{13}C-NMR spectra.

Juncus effusus (NO Juncaceae), popularly known as 'common rush', grows abundantly in moist depressions, edges of ponds and lakes and fresh water marshes in Southeastern United States. Our interest in the chemistry of Juncaceae[2,3] led us to investigate this fresh water rush. The $CHCl_3$ soluble part of the 95% EtOH extract of the aerial parts of *J. effusus*, upon column chromatography, PTLC, and crystallization yielded, inter alia, effusol, $C_{17}H_{16}O_2$ (M+252), m.p. 177–178 °C and juncusol[3]. In this communication, we wish to report the structure of effusol as **1**, based on chemical and spectral (^1H and ^{13}C-NMR) evidence. Effusol is the first example of a phenolic 9,10-dihydrophenanthrene isolated from a fresh water *Juncus* having both alkyl and vinyl groups in the skeleton. The alkylated 9,10-dihydrophenanthrenes which are present in both *J. effusus*, a fresh water species and *J. roemerianus*, a salt water species[3], seem to be characteristic of the genus.

Effusol, upon acetylation with Ac^2O and Py afforded a diacetate, $C_{21}H_{24}O_4$(M+336) suggesting that both the O atmos are present as OH functions in the parent compound. The IR-spectrum of effusol in nujol showed bands at 3380 (OH), 1600 (Ar) and 910 (monosubstituted vinyl) cm^{-1}. A 4H singlet at 2.66 ppm in the 60 MHz ^1H-NMR spectrum of effusol in $(CD_3)_2CO$ is typical of 9,10-dihydrophenanthrenes[5]. The ^1H-NMR spectrum also showed a peak at 2.23 (*s*, 3H, Ar–CH_3), typical ABX type of signals for a vinyl group at 5.20 (1H, J_{BX}= 11Hz; J_{AB}=2Hz), 5.63 (1H, J_{AX}= 17Hz; J_{AB}=2Hz) and 6.95 (1H, J_{AX}=17Hz; J_{BX}=11Hz; J_{AB}=2Hz) ortho aromatic proton doublets at 6.73 (1H, J=8Hz) and 7.23 (1H, J=8Hz) and 2 meta aromatic proton doublets at 6.76 (1H, J=1.5Hz) and 6.93 (1H, J=1.5Hz) ppm. The lowfield ortho coupled proton at 7.23 ppm indicates that the C-3 and C-4 in effusol are unsubstituted. The ^1H-NMR chemical shifts strongly suggests that ring A of effusol (**1**) is identically substituted as the corresponding ring in juncusol (**2**). The presence of only 1 aromatic proton at a field lower than 7.00 ppm indicates that C-5 in effusol is substituted[2]. Therefore, in view of the presence of 2 meta related protons in the ^1H-NMR spectrum, C-7 in effusol must also be substituted. Effusol gives a negative Gibbs test[5] showing that the positions para to OH groups are substituted. Therefore, 1 of the OH groups must be placed at C-7 and consequently, the vinyl group is present at C-5. The co-ocurrence of effusol and juncusol indicates structure **1** for the former which is supported by the ^{13}C-NMR spectrum.

The ^{13}C-NMR spectrum of effusol showed 17 signals corresponding to 17 carbons in the molecule. The chemical shifts in ppm, indicated in **1**, were assigned on the basis of the direct analysis of the non-protonated centers, partially and completely decoupled spectra and by comparison with the spectrum of juncusol[6]. The ^{13}C-NMR spectrum of effusol is very similar to that of juncusol with the following significant difference: In place of a singlet at 120.6 ppm (C-3) and a quartet at 13.2 ppm (C-3-CH_3) in the spectrum of juncusol, as indicated in **2**, there is an additional doublet at 113.6 ppm (C-6) in the spectrum of effusol.

Therefore, effusol should be represented by **1**.



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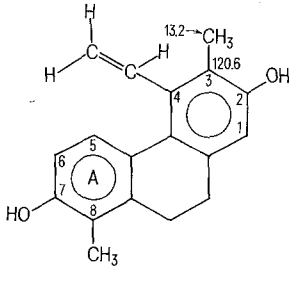

2

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