

6-Azasteroidal Analogues from  $\alpha$ -Hydroxymethylene Ketones

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Sir:

In connection with our studies on heterocyclic ring systems from  $\alpha$ -hydroxymethylene ketones (1) we wish now to report the synthesis of some 6-azasteroidal analogues, in order to study their biological properties.

Treatment of the 2-acetyl-3-cyclohexane-1,3-dione (2) with *m*-anisidine in refluxing ethanolic solution afforded, in 95% yield, the 2- $\alpha$ -(*m*-methoxyanilino)ethylidene-cyclohexane-1,3-dione (I), m.p. 132°, exhibiting ir bands at 1640, 1605 and 1565  $\text{cm}^{-1}$  and nmr (deuteriochloroform) NH signal at  $\delta$  (ppm)  $\sim$  15, thus supporting the ketoamine structure (3).

Compound I was cyclodehydrated with PPA at 100°, giving only II, m.p. 147°, in 70% yield. Nmr signals (deuteriochloroform) of the aromatic protons gave a pattern which can be approximately interpreted as an ABX system;  $\delta_A$  7.24 *d* (H-4),  $\delta_B$  7.07 *dd* (H-2),  $\delta_X$  7.75 *d* (H-1);  $J_{AB} = 2.5$  Hz,  $J_{AX} < 1$  Hz and  $J_{BX} = 9$  Hz.

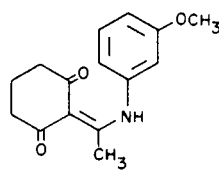
The values of the reported coupling constants exclude the alternative structure resulting from the cyclization *ortho* to the methoxy group.

The phenanthridone derivative II upon treatment with ethyl formate and sodium methoxide in benzene solution afforded 3-methoxy-6-methyl-7-oxo-8-hydroxymethylene-7,8,9,10-tetrahydrophenanthridine (III), m.p. 173°, nmr (deuteriochloroform)  $\delta$  7.76 *bs* ( $=\text{CH-OH}$ ). The hydroxymethylene ketone III so obtained was the intermediate for 6-azasteroidal analogues; in fact by reaction of III with hydrazine hydrate was obtained the 4-methyl-7-methoxy-10,11-dihydro-2*H*-pyrazolo[3,4-*i*]phenanthridine (IV), m.p. 234°, in 75% yield; nmr (DMSO- $d_6$ ):  $\delta$  7.52 *t* ( $J = 0.7$  Hz) ( $=\text{CH-N}$ ) and 12.70 *bs* (NH). Moreover, the reaction of the intermediate III with hydroxylamine hydrochloride in ethanol with sodium acetate at room temperature, gave the 3*a*-hydroxy-4-methyl-7-methoxy-10,11-dihydro- $\Delta^1$ -isoxazolino[5,4-*i*]phenanthridine (V), m.p. 229°, in 80% yield; its structure was confirmed by nmr spectrum (DMSO- $d_6$ ):  $\delta$  (ppm)  $\sim$  3.60 *m* (C-11a H), 7.58 *d* ( $J = 5.5$  Hz) ( $=\text{CH=N}$ ) and 10.70 *s* (OH); these data are in agreement with those reported for similar structures (4,5). In addition, the isoxazoline derivative V was also readily dehydrated with trifluoroacetic acid to give 4-methyl-7-methoxy-10,11-dihydroisoxazolo[5,4-*i*]phenanthridine (VI), m.p. 178°, nmr (deuteriochloroform)

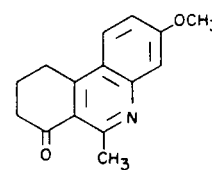
$\delta$  8.30 *s* and (DMSO- $d_6$ )  $\delta$  8.55 *s* ( $=\text{CH=N}$ ).

The details will be discussed in the forthcoming full paper.

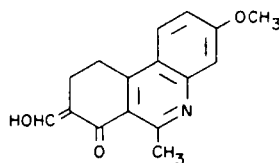
Satisfactory spectral data and elemental analyses were obtained for all the compounds described.



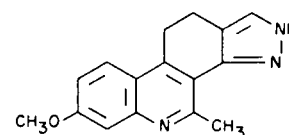
I



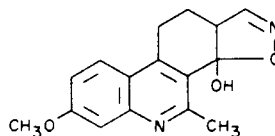
II



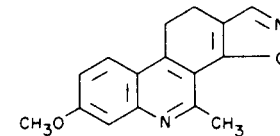
III



IV



V



VI

## Acknowledgment.

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## REFERENCES

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