

Reprint from

RECENT ADVANCES
IN DOPING ANALYSIS
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The influence of antimalarial drugs on dope testing

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Introduction

Malaria is one of the most serious tropical diseases in many parts of the world despite major control campaigns. The malaria situation is deteriorating and resistance of the malaria parasite to antimalarial drugs is increasing and becoming more widespread. The malaria parasite is transmitted to human beings by the bite of a mosquito.

The risk of contracting malaria can be reduced by avoiding high risk areas or by visiting epidemic malaria areas in years when rainfall is low or during the dry season.

Prophylaxis against malaria can be divided in two categories namely:

1. Precautionary measures to avoid mosquito bites (personal protection).
2. The taking of antimalarial drugs.

Often sportspersons coming to South Africa for competitions or training sessions are taking antimalarial drugs.

Aim

The aim of this study is to summarize the influence of antimalarial drugs on dope testing.

Method:

Antimalarial drugs consist of:

1. Chloroquin
2. Mefloquine
3. Quinine
4. Proguanil

Excretion studies were performed for each of these drugs and the urine subjected to screening for all the classes of banned substances.

Results

The results are shown in figure 1 - 11. Chloroquin and mefloquine have no influence on any of the screening procedures.

A metabolite of quinine is partially coeluting with testosterone (fig.11) but this can be removed by extraction with n-pentane.

Proguanil has an influence on the screen for stimulants and it is possible that it can be used as a masking agent for stimulants (fig. 8-10). When we are obtaining a urine sample with proguanil we will inject the extract obtained from the screen for stimulants on the GC/MSD and run a macro with ion extractions for the different stimulants. By doing this the presence of any stimulants can be revealed.

Conclusion

It is clear that the use of antimalarial drugs do not have a serious influence on dope testing. Proguanil can be a masking agent for stimulants and urine samples from competitors using proguanil should be checked carefully for the presence of stimulants.

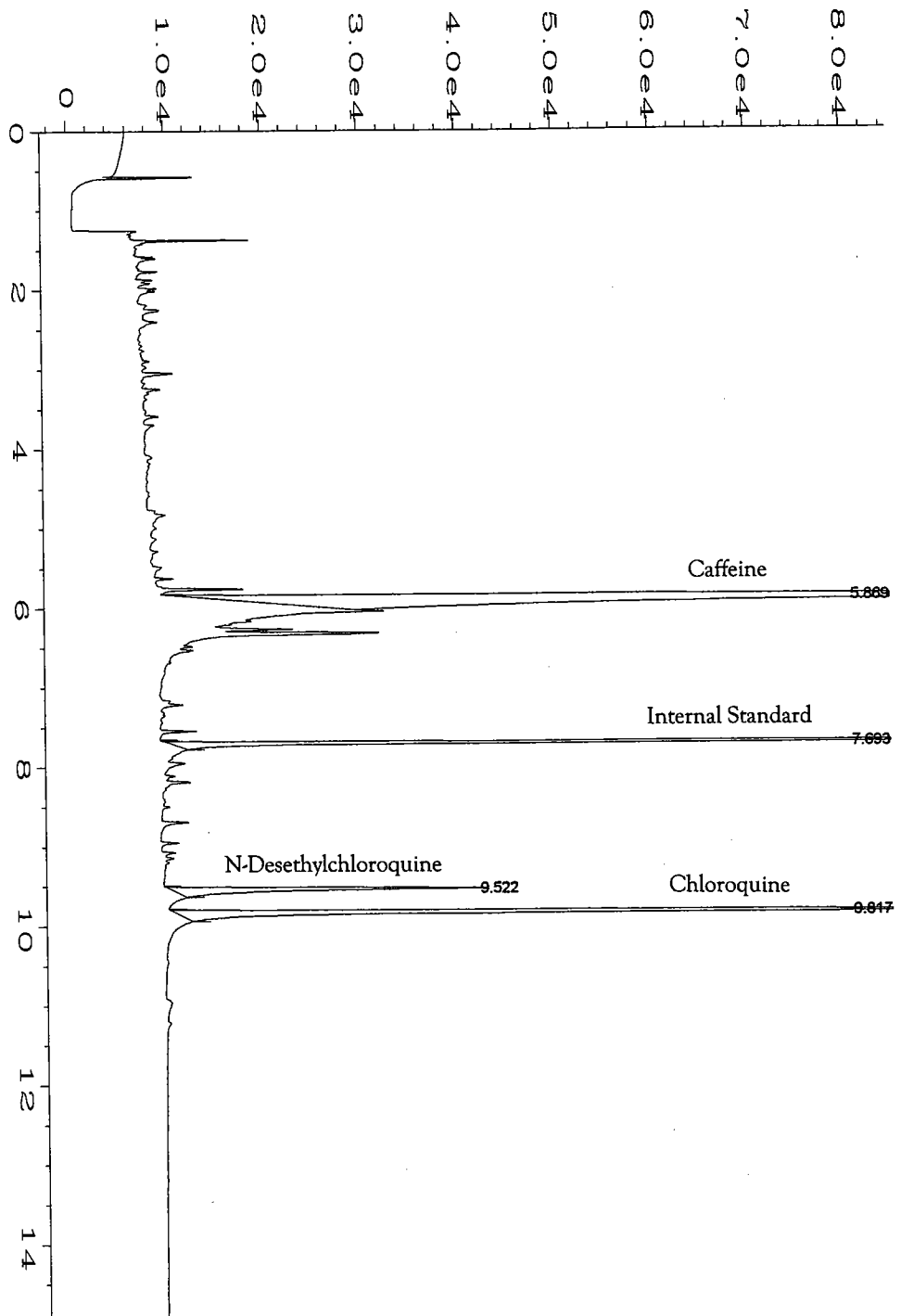


Fig 1 Gas chromatogram obtained from urine from an excretion study of chloroquin when extracted as for stimulants.

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Instrument : 5972 - In
Sample Name : 043230
Vial Number : 8

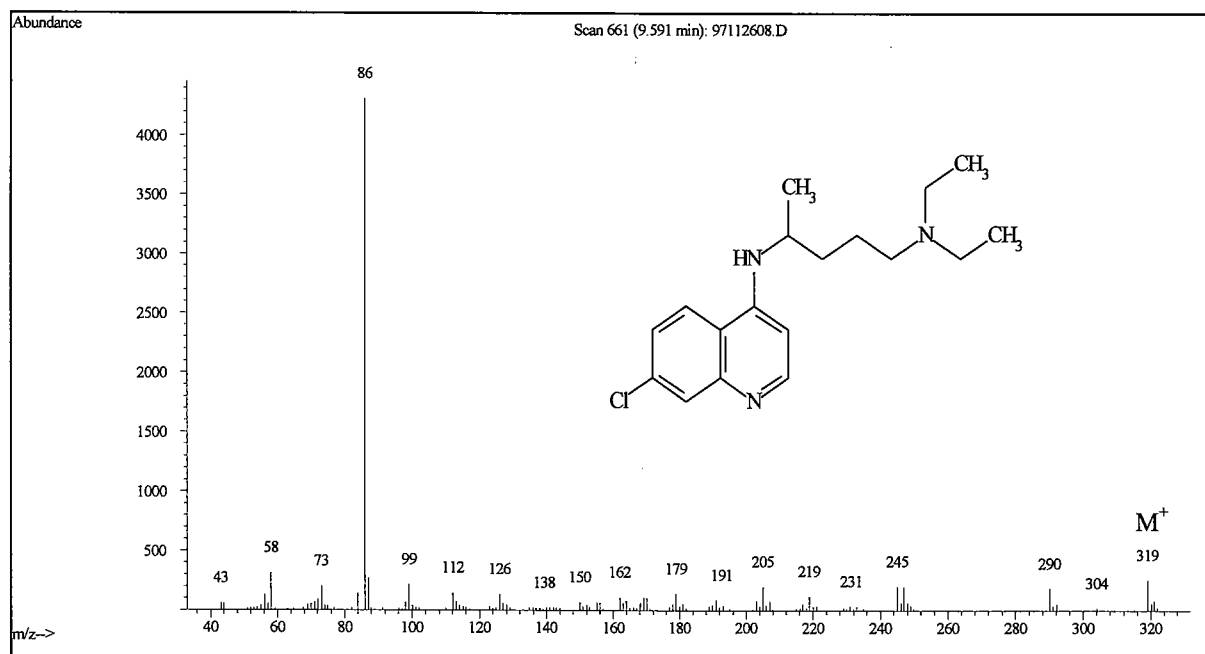
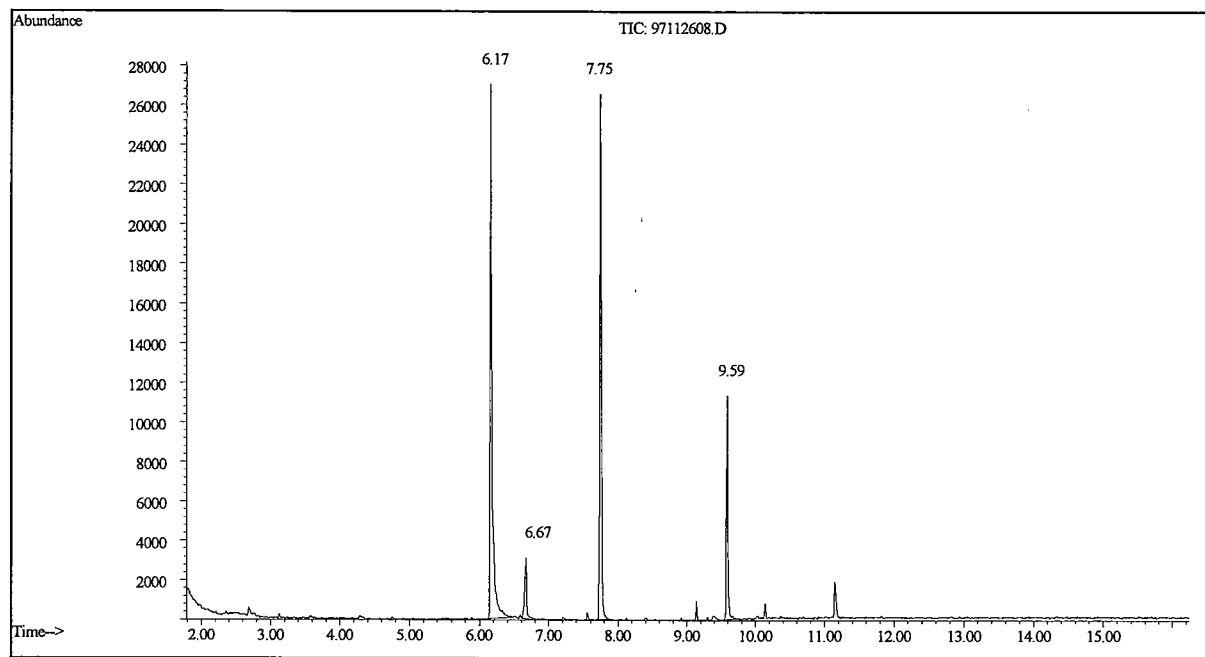


Fig 2 TIC and mass spectrum of chloroquine.

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Instrument : 5972 - In
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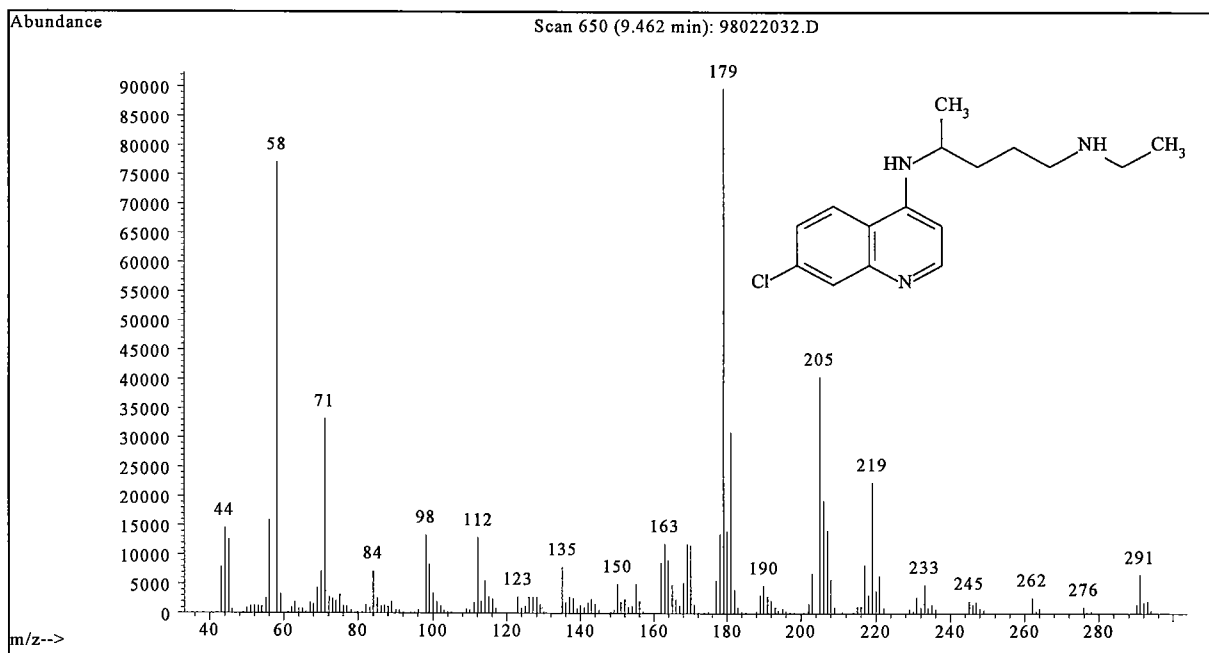
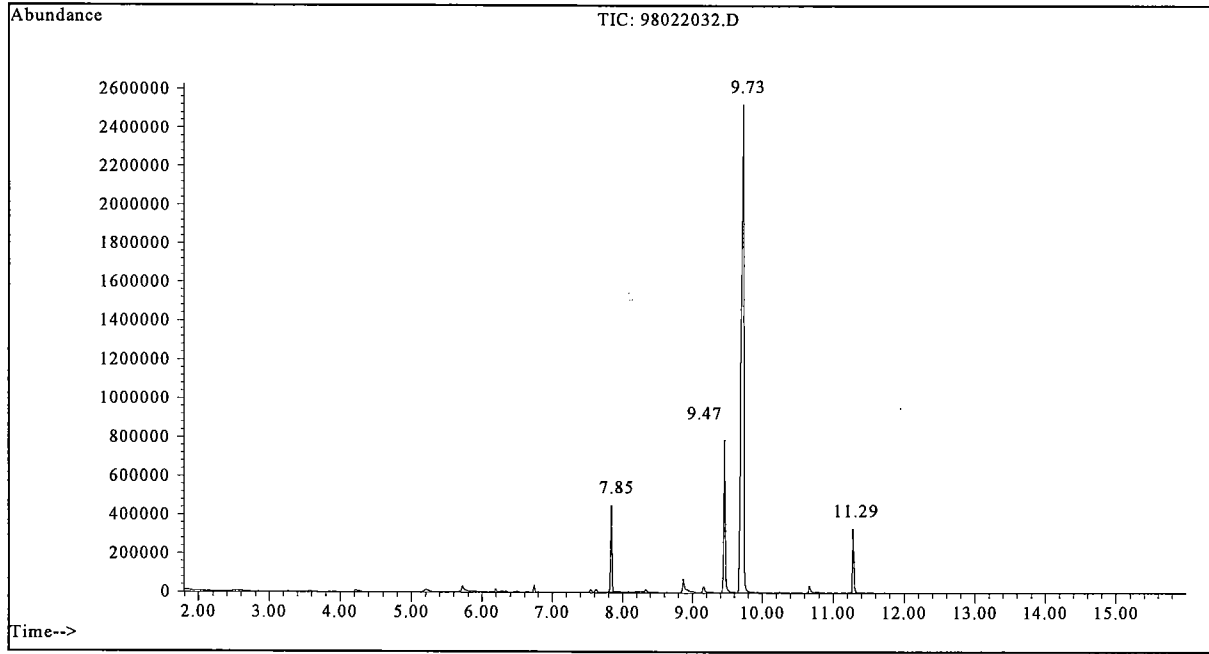


Fig 3 TIC and mass spectrum of chloroquin metabolite (N-desethylchloroquin).

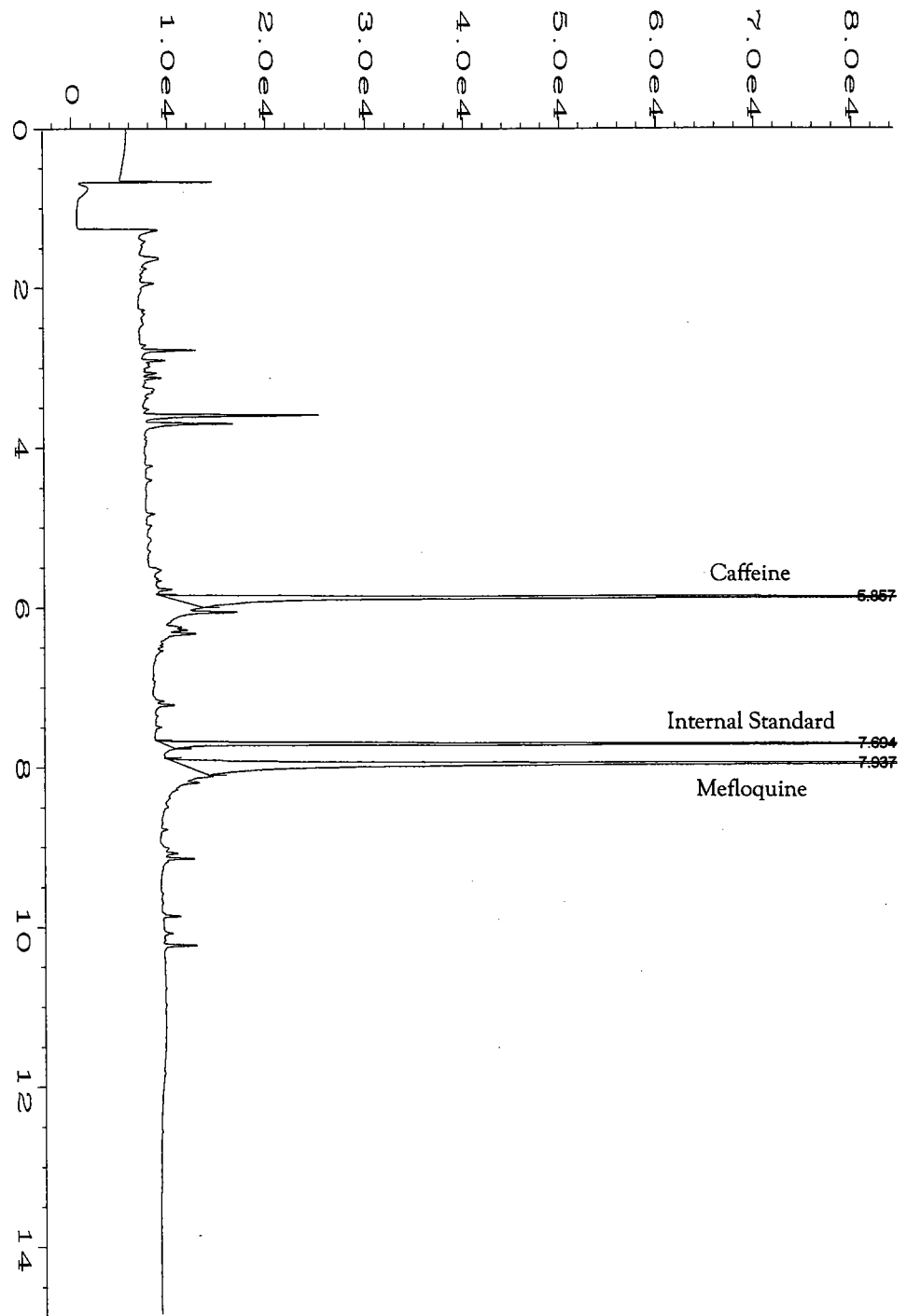


Fig 4 Gas chromatogram obtained from urine from an excretion study of mefloquine when extracted as for stimulants.

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Sample Name : 043374
Vial Number : 4

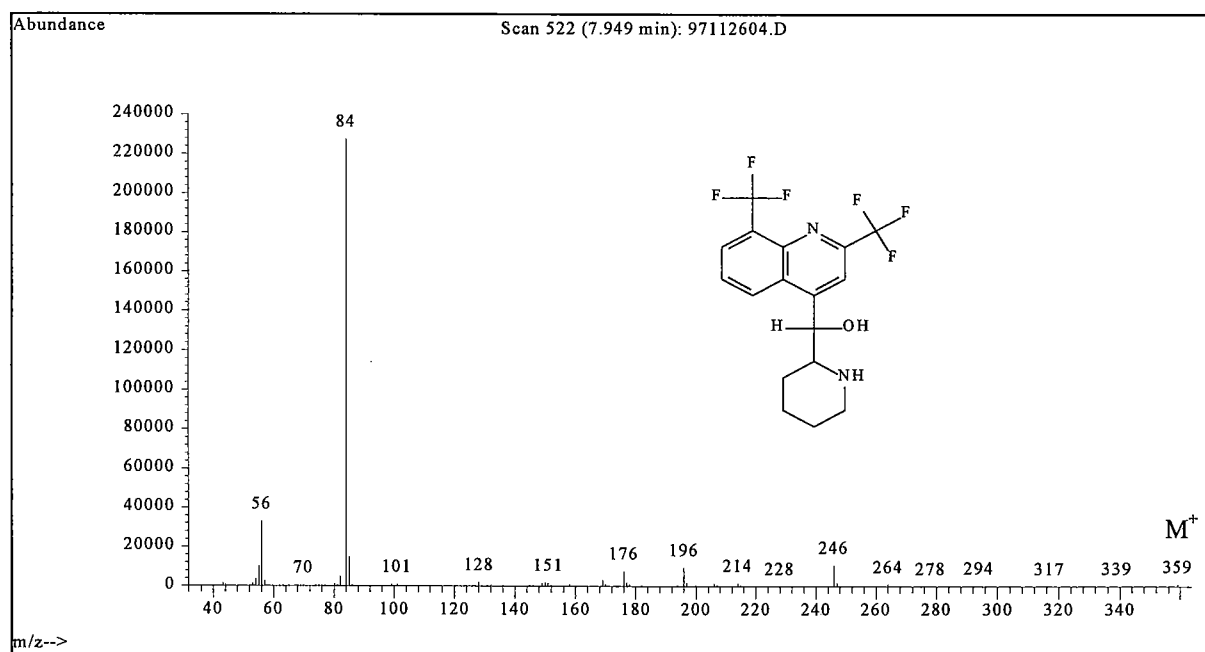
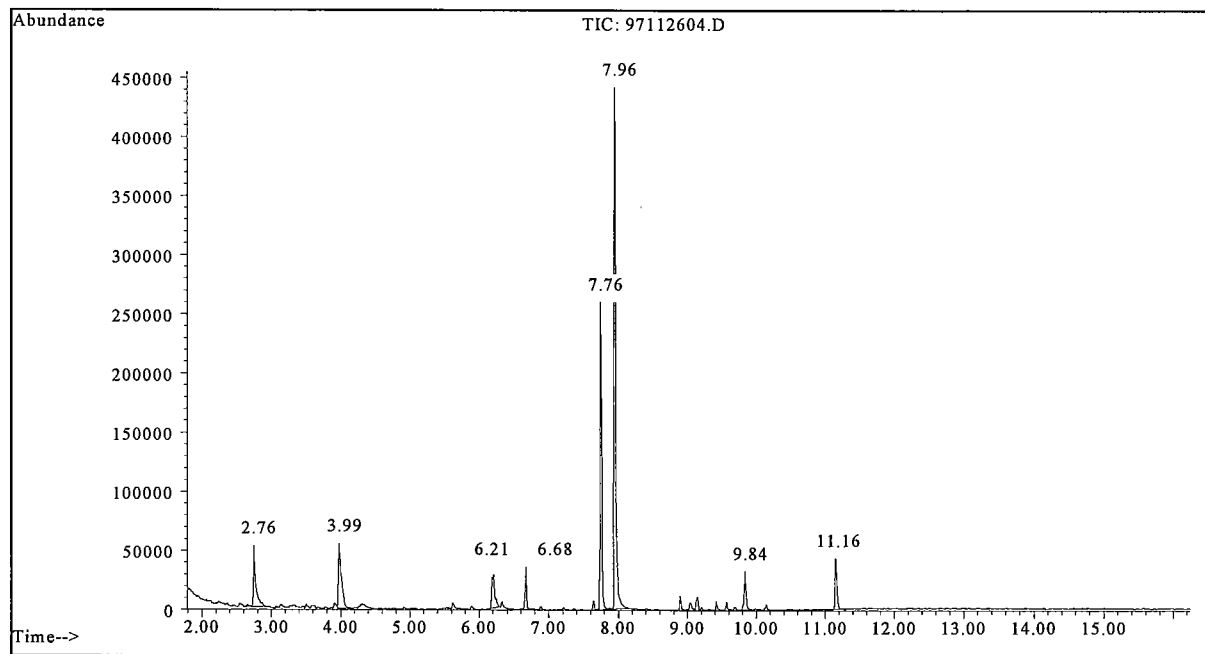


Fig 5 TIC and mass spectrum of mefloquine.

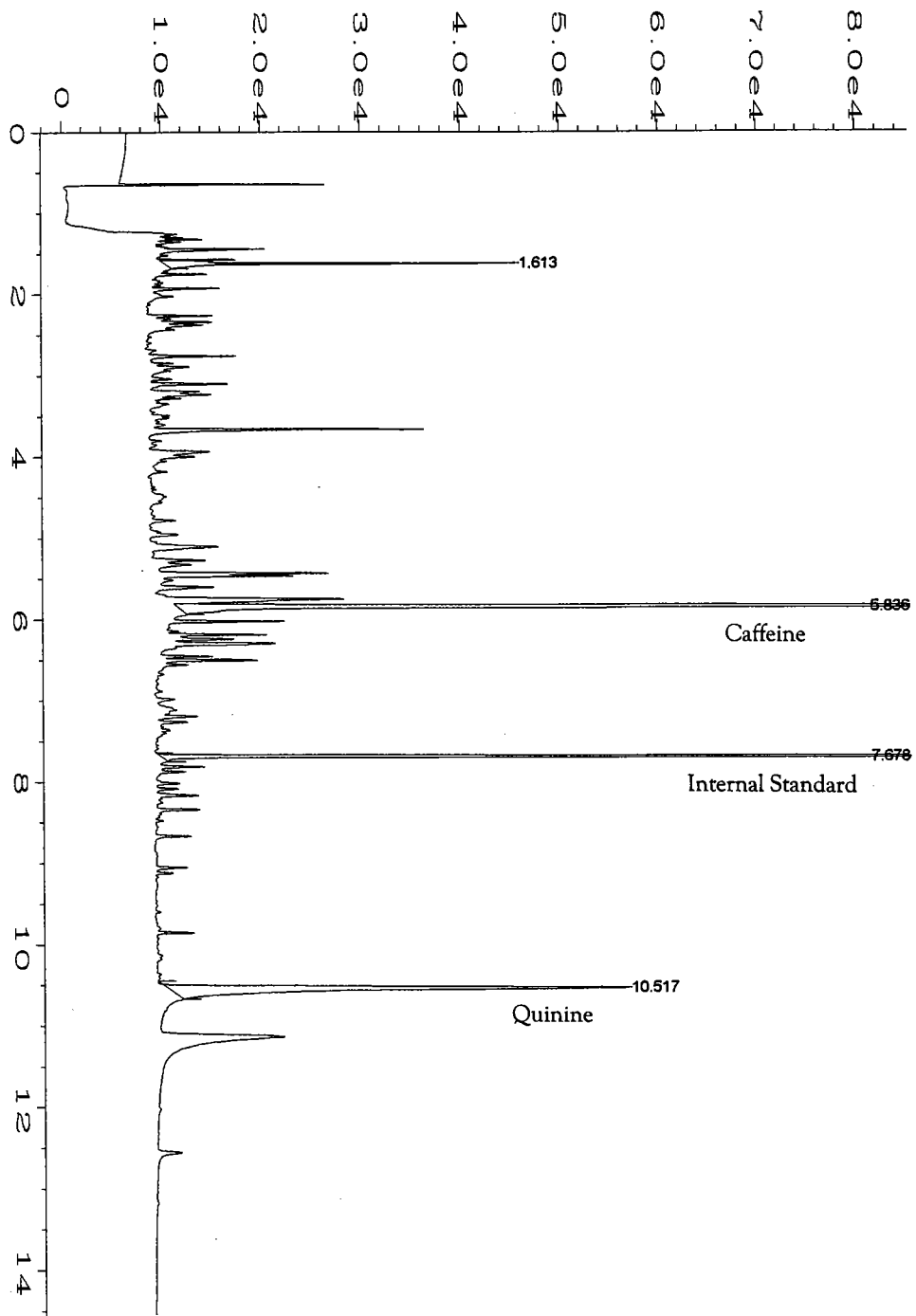


Fig 6 Gas chromatogram obtained from urine from an excretion study of quinine when extracted as for stimulants.

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Instrument : 5972 - In
Sample Name : 101419
Vial Number : 18

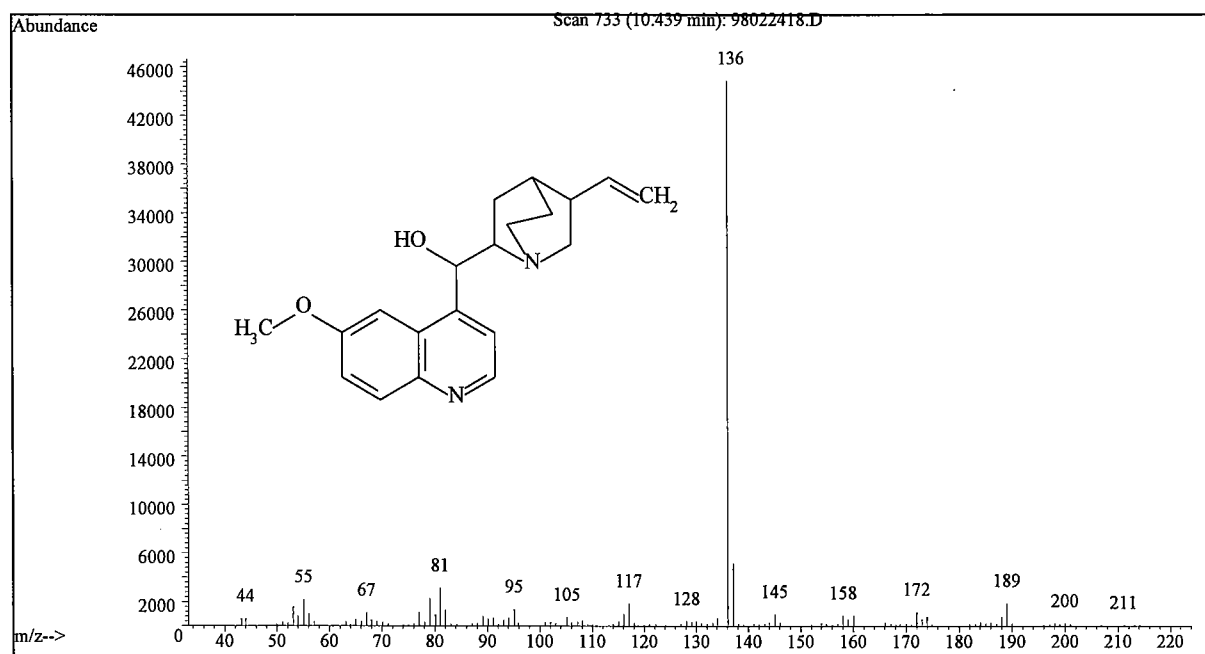
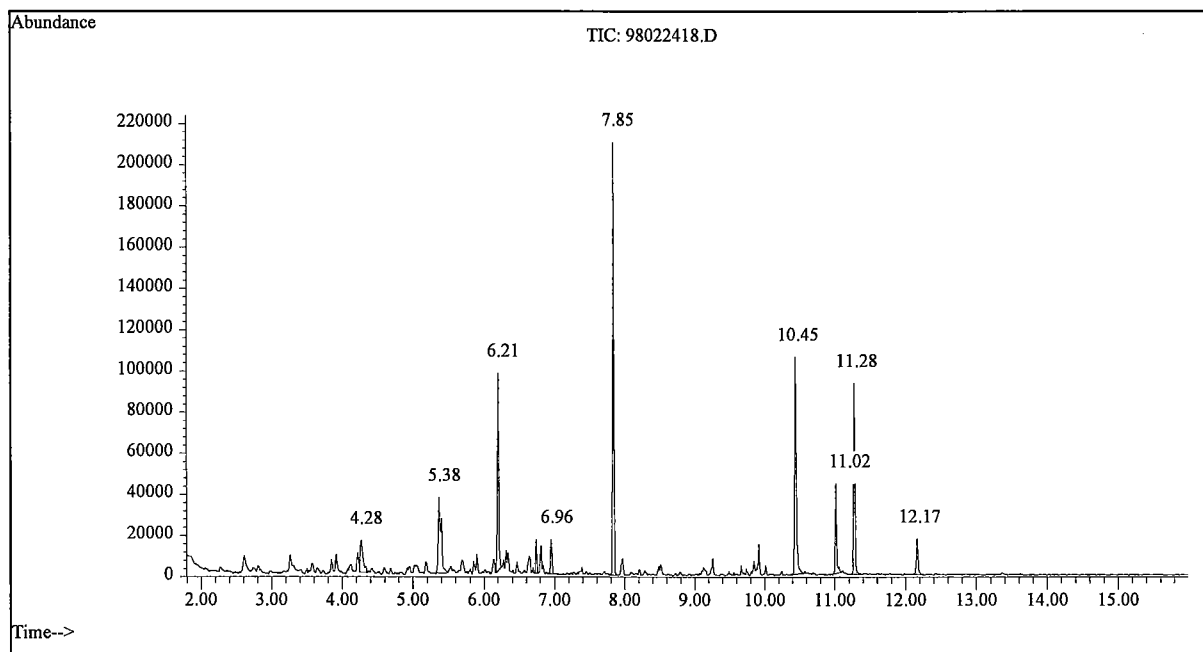


Fig 7 TIC and mass spectrum of quinine.

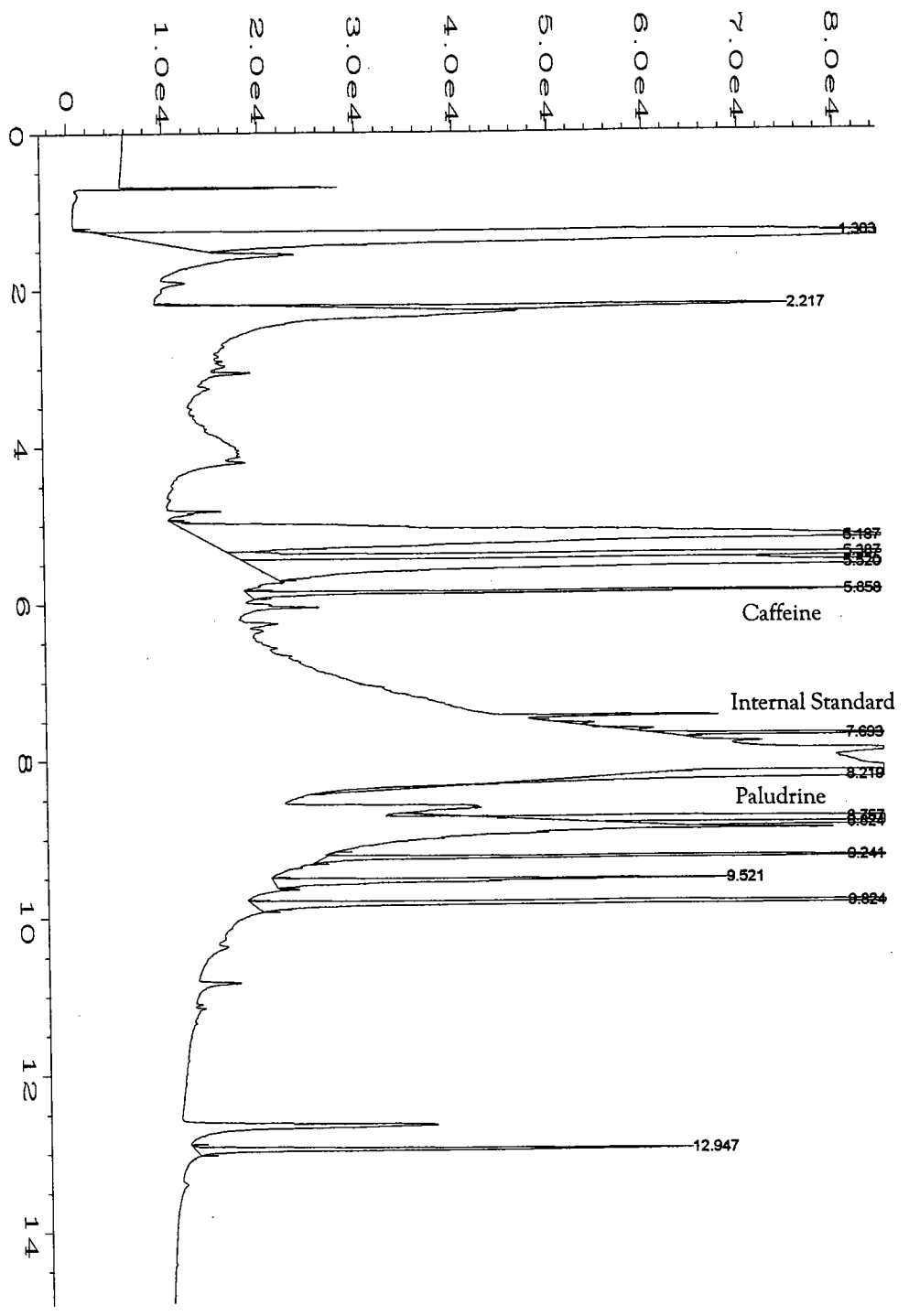


Fig 8 Gas chromatogram obtained from urine from an excretion study of proguanil when extracted as for stimulants (pH = 12).

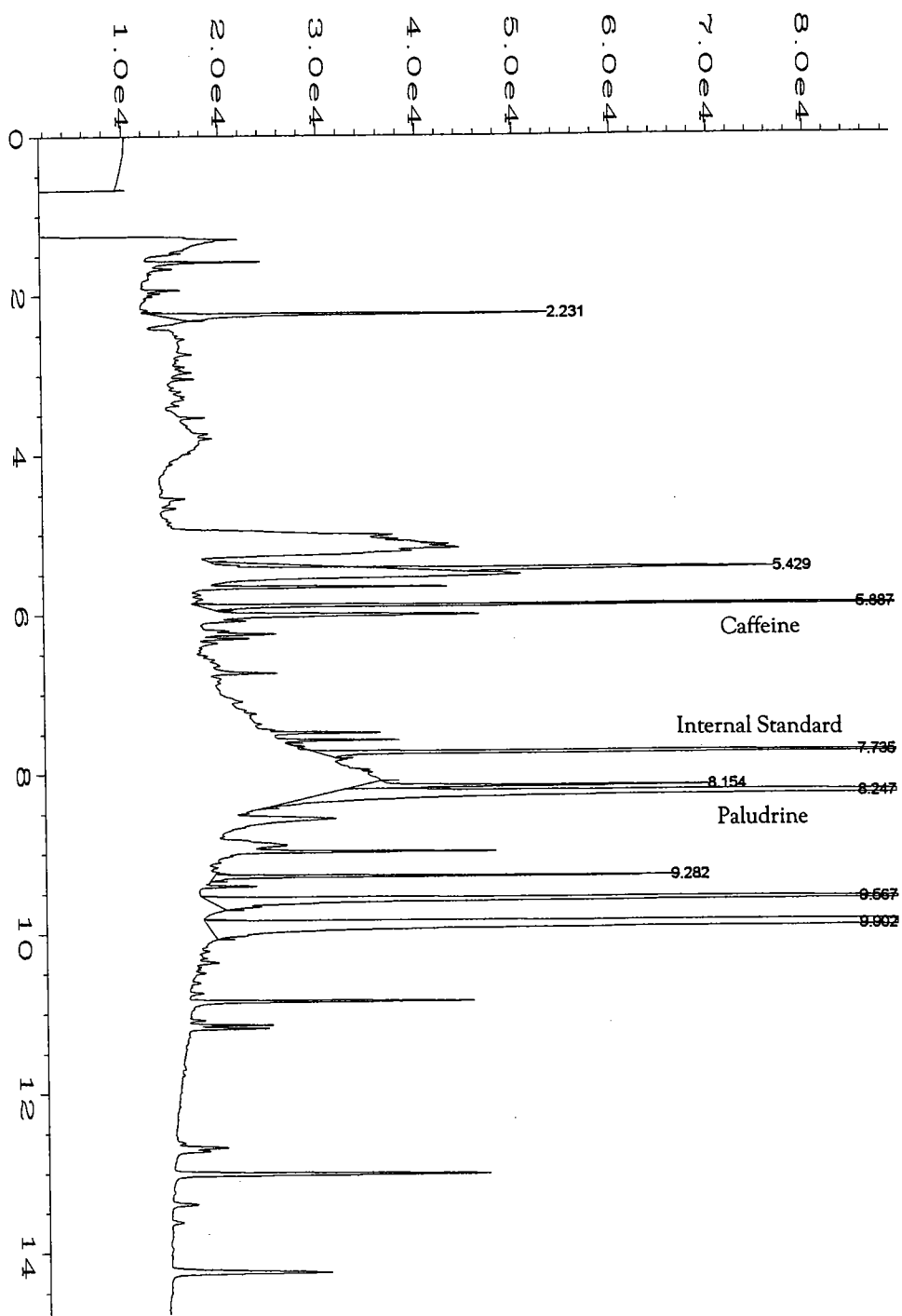


Fig 9 Gas chromatogram obtained from urine from an excretion study of proguanil when extracted as for stimulants (pH = 9.5).

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Sample Name : 043237
Vial Number : 6

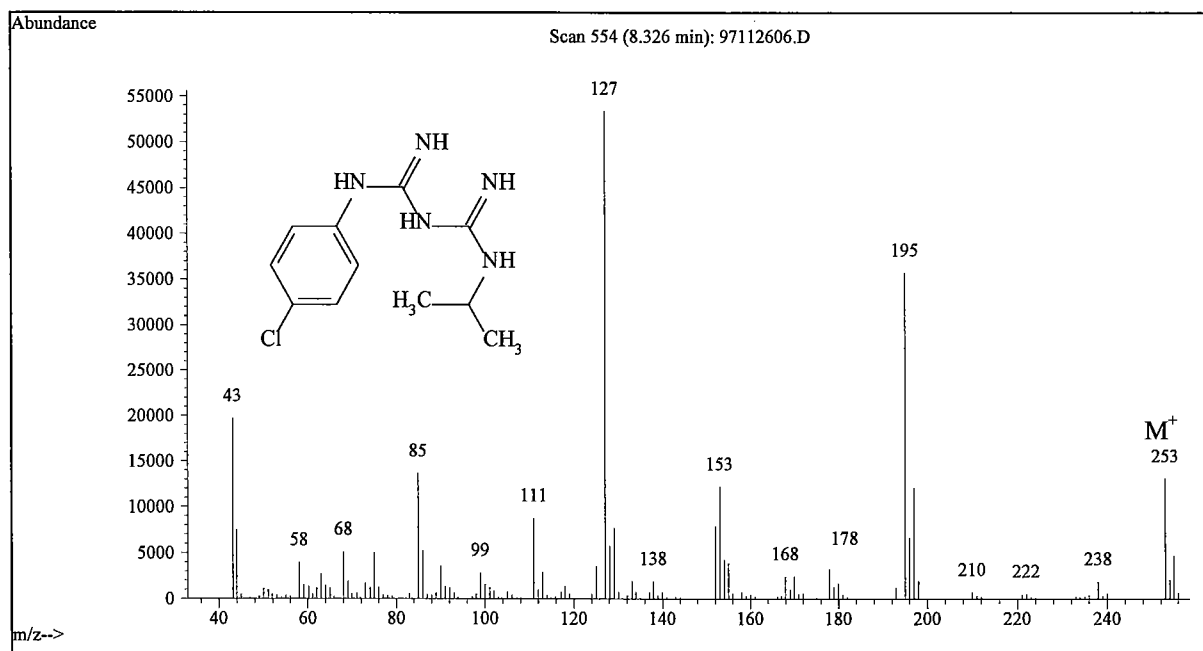
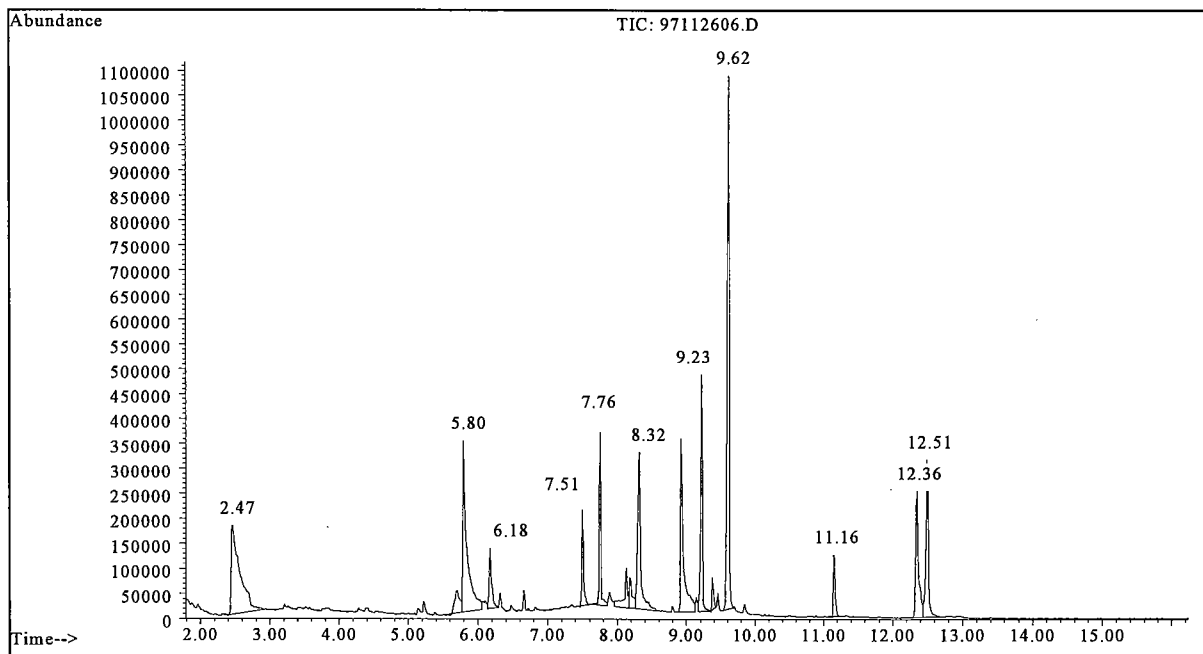


Fig 10 TIC and mass spectrum of proquanal.

File : U:\SPORTMSDATA\OBELIX\98031128.D
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Instrument : 5973 - In
Sample Name: Testosterone & Quinine
Vial Number : 26

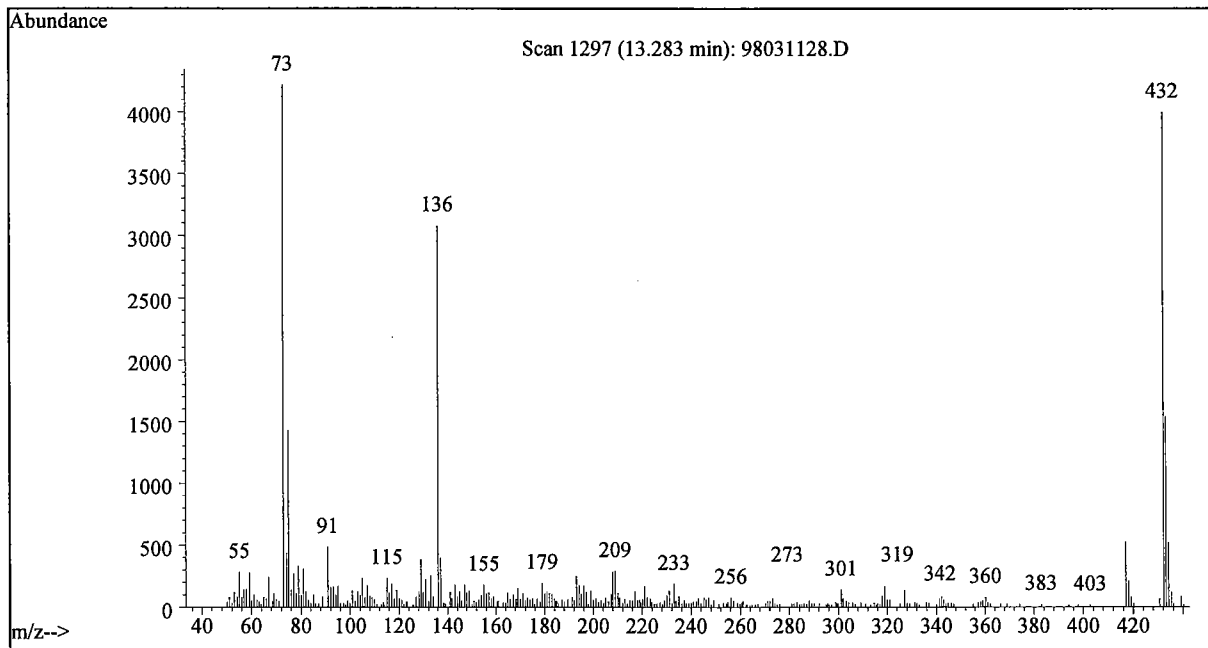
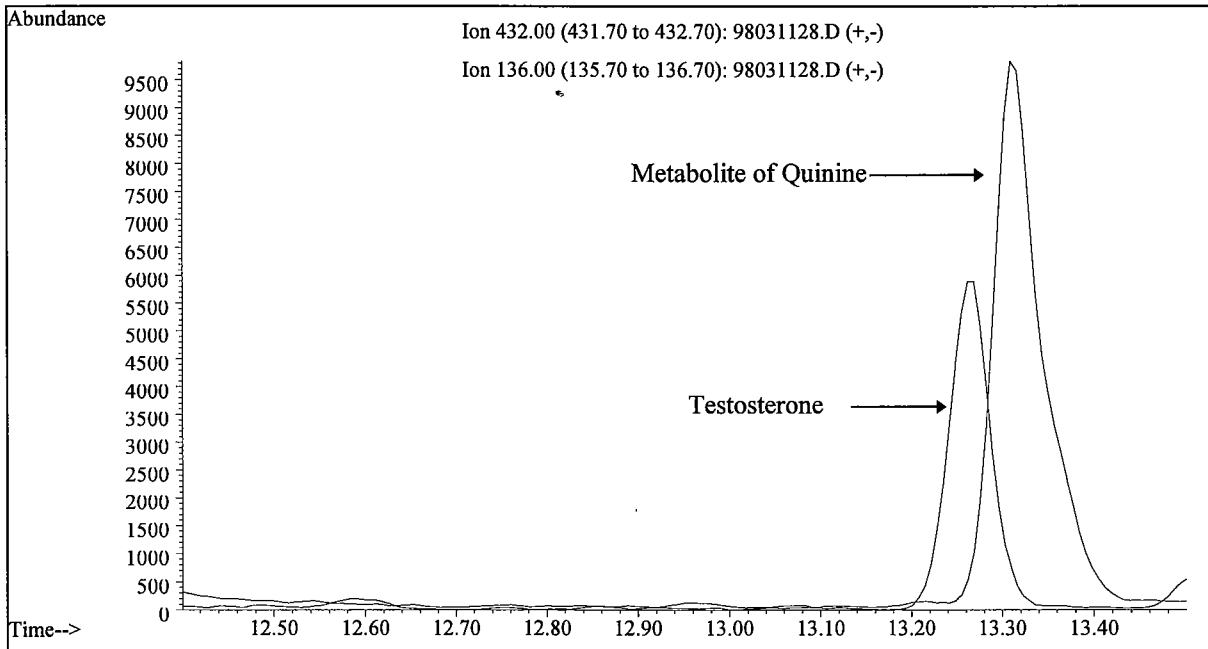


Fig 11 Partial coelution of testosterone and a metabolite of quinine.