

## Cuticular hydrocarbons in *Anopheles gambiae*: preliminary results and future perspectives.

B Caputo<sup>1</sup>; FR Dani<sup>2</sup>; GL Horne<sup>3</sup>; A Diabate<sup>4</sup>; N'F Sagnon<sup>5</sup>, C Costantini<sup>6</sup>, V Petrarca<sup>7</sup>; S Turillazzi<sup>2</sup>; M Coluzzi<sup>2</sup>; AA Priestman<sup>3</sup>; A. della Torre<sup>1</sup>

<sup>1</sup> Sezione di Parassitologia, Dipartimento di Scienze di Sanità Pubblica, Università "La Sapienza", Roma, Italy.

<sup>2</sup> Centro Interdipartimentale di Spettrometria di Massa, Università di Firenze, Firenze, Italy;

<sup>3</sup> Department of Biological Sciences, Faculty of Health and Sciences, Staffordshire University, Stoke-on-Trent, UK;

<sup>4</sup> IRSS/Centre Muraz, Bobo-Dioulasso, Burkina Faso;

<sup>5</sup> Centre Nationale de Recherche et Formation sur le Paludisme, Ouagadougou, Burkina Faso;

<sup>6</sup> Institut de Recherche pour le Développement, Ouagadougou, Burkina Faso;

<sup>7</sup> Dipartimento di Genetica e Biologia Molecolare, Università "La Sapienza", Roma, Italy.

Lipids covering the insect cuticle are critical to prevent body dehydration and are known to play semiochemical functions in several contexts of insect biology. Cuticular hydrocarbons (CHCs) generally represent the most abundant epicuticular lipids and have been characterised in several insect taxa, including some species of the genus *Aedes* (<sup>1,2,3,4</sup>). To date, however, the CHC profile of Anophelines has been characterised only in the *An. quadrimaculatus* complex<sup>5</sup>, and partially in the *An. gambiae* complex, where studies were aimed at investigating the possibility of using CHCs as taxonomic characters to identify adults of different species of the complex<sup>6,7</sup>, or in highlighting the possible role of CHCs as contact pheromones during mosquito courtship<sup>8</sup>, as already shown in some *Culex*<sup>9</sup> and in *Aedes*<sup>10</sup> species. In fact, CHCs have been investigated as taxonomic and systematic characters in several insect taxa, among which mosquito sibling species complexes. Although no inter-specific qualitative differences in the composition of the CHC profile have been ever shown, the relative abundance of some compounds has been found to differ among closely related Anopheline species: i) *An. gambiae* and *An. arabiensis*<sup>6</sup>; ii) some species of the *An. maculipennis* complex<sup>11</sup>; iii) malaria vector and non-vector forms of the *An. maculatus* complex<sup>12,13</sup>; iv) the five members of *An. quadrimaculatus* complex<sup>5</sup>. Studies on mosquitoes have also shown the existence of high levels of variations in the relative abundance of CHCs correlated to geographic and physiological parameters. Variations in relation to age conditions have been showed in females of *Ae. aegypti*<sup>14,15,1,8,16</sup>, *Cx. quinquefasciatus*<sup>17</sup>, *An. gambiae*<sup>8</sup> and *An. stephensi*<sup>18</sup>.

In the last few years, we have carried out Gas Chromatography-Mass Spectrometry and Gas Chromatography analyses of the CHC profile of laboratory and field specimens of M and S *An. gambiae* s.s. forms and its sibling species *An. arabiensis*, with the aim to: 1) provide a complete characterisation of CHC composition of *An. gambiae* cuticle; 2) evaluate whether possible age-related changes in CHC profiles can be used to develop a model to predict the age of field specimens; and 3) evaluate whether the 3 taxa differ in the CHC profile and whether these differences may be linked to pre-mating isolation barriers. The preliminary results of these analyses will be presented and future perspectives of this field of research will be discussed.

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