

Use of *Carapa guianensis* Aubl. agro-industrial waste as an alternative for obtaining bioproducts

Kyouk Isabel Portilho dos Santos^{a*}

Wandson Braamcamp de Souza Pinheiro^b

Renan Campos e Silva^b

Anderson de Santana Botelho^b

Liderlânio de Almeida Araújo^c

Ivete Furtado Ribeiro Caldas^c

- a. a. Programa de Pós Graduação em Biodiversidade e Biotecnologia da Rede BIONORTE, Universidade Federal do Pará (PPG-BIONORTE/ICB/UFPA), Rua Augusto Correa, 01, CEP 66075-110, Belém, PA, Brazil.
- b. Laboratório Central de Extração, Programa de Pós-Graduação em Química, Universidade Federal do Pará (CE/PPGQ/ICEN/UFPA), Rua Augusto Correa, 01, CEP 66075-110, Belém, PA, Brazil.
- c. Universidade do Estado do Pará, Cametá 1872, Brazil

*Correspondence:

Kyouk Isabel Portilho dos Santos

kyoukportilho@yahoo.com.br

Kyouk Isabel Portilho dos Santos [0000-0003-2843-791X](tel:0000-0003-2843-791X)

Wandson Braamcamp de Souza Pinheiro [0000-0003-2977-8863](tel:0000-0003-2977-8863)

Renan Campos e Silva [0000-0002-0846-9140](tel:0000-0002-0846-9140)

Anderson de Santana Botelho [0000-0002-3143-4608](tel:0000-0002-3143-4608)

Liderlânio de Almeida Araújo [0000-0002-4081-4354](tel:0000-0002-4081-4354)

Ivete Furtado Ribeiro Caldas [0000-0002-2095-101X](tel:0000-0002-2095-101X)

SUPPLEMENTARY MATERIAL

SECTION S1

Figure S1A – Spectrum of NMR ^1H from gedunin.

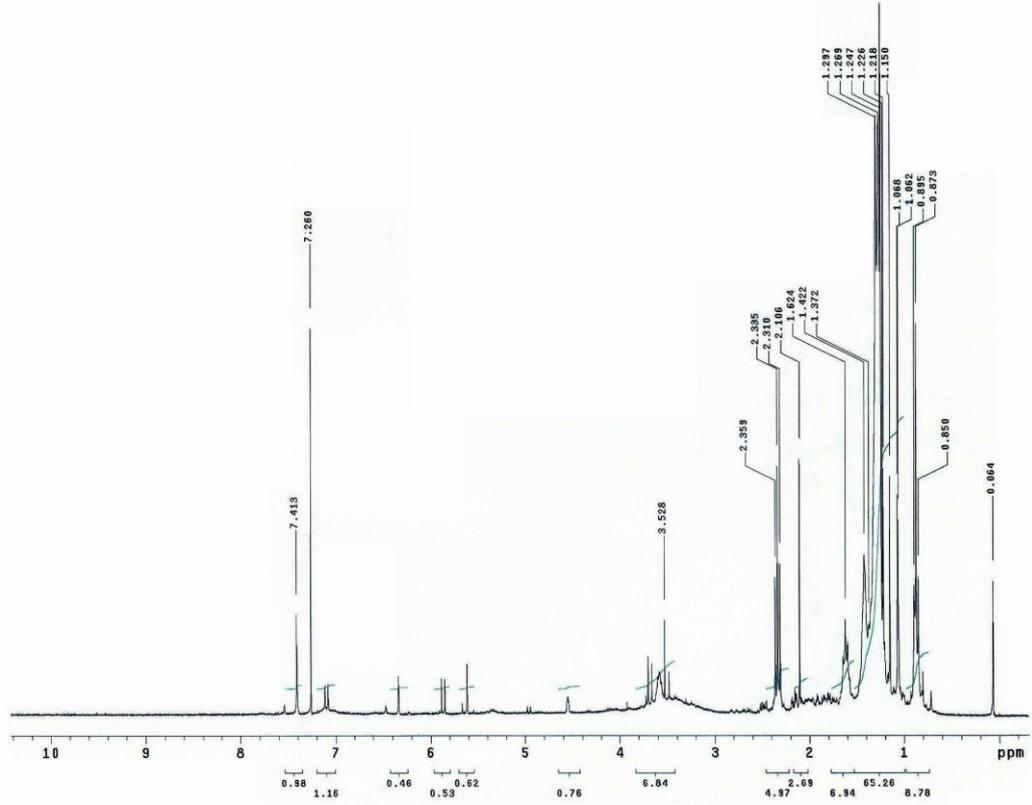


Figure S1B – Spectrum of NMR ^{13}C from gedunin.

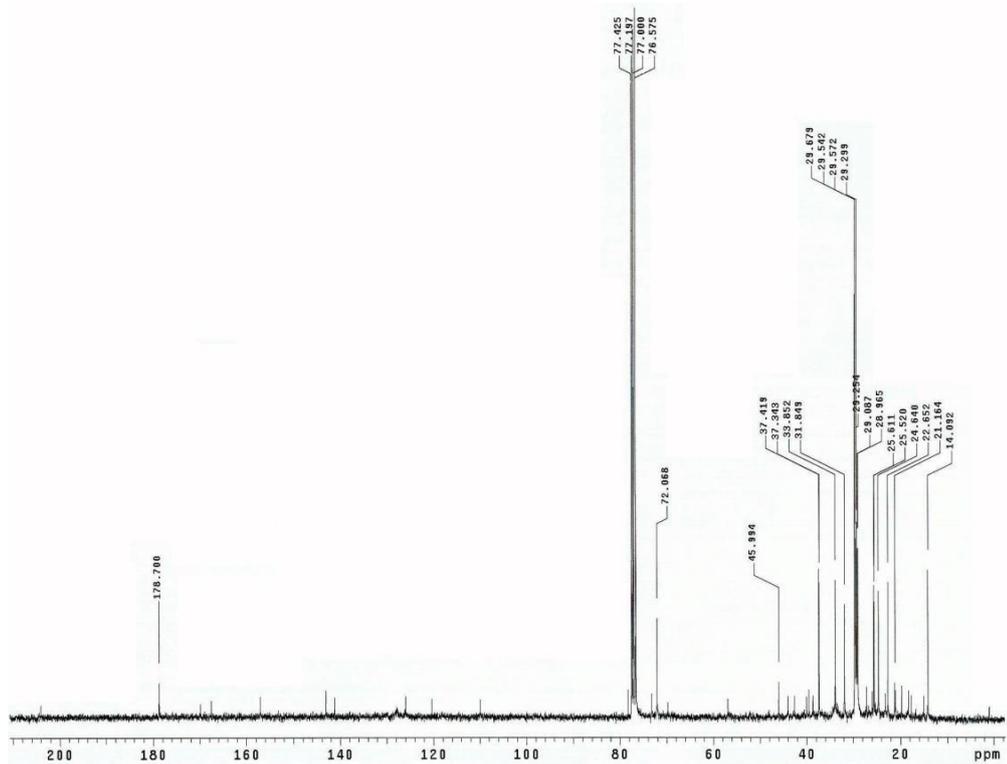
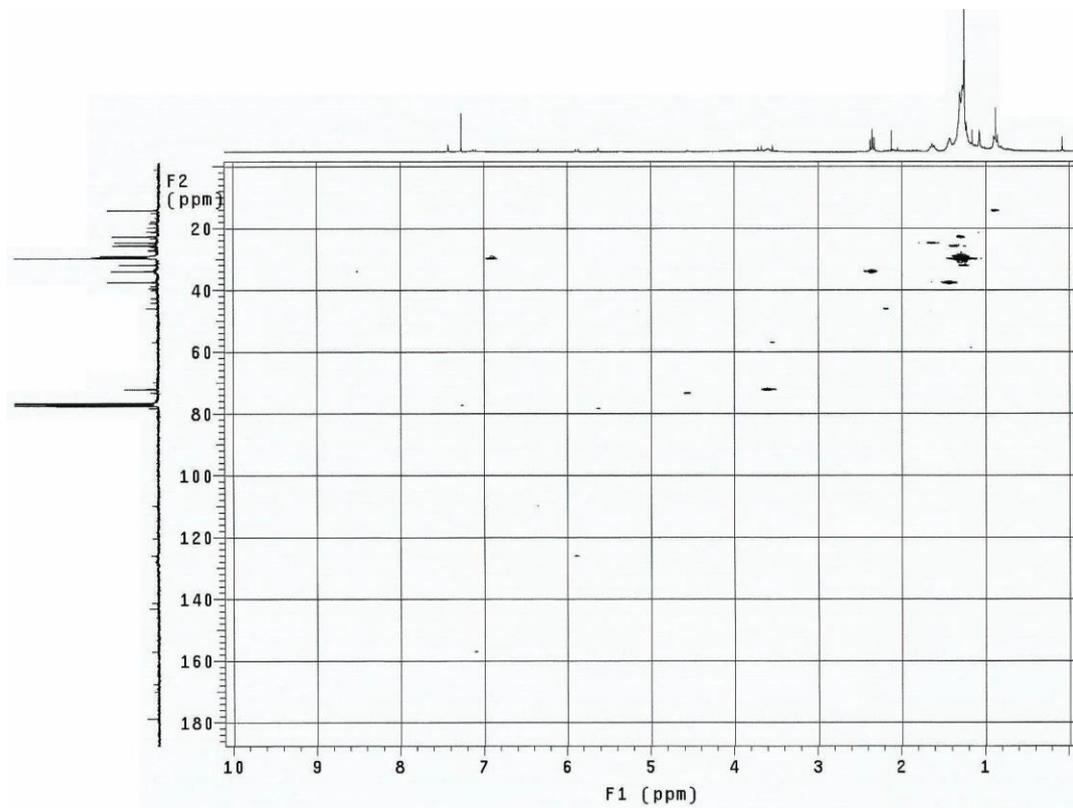
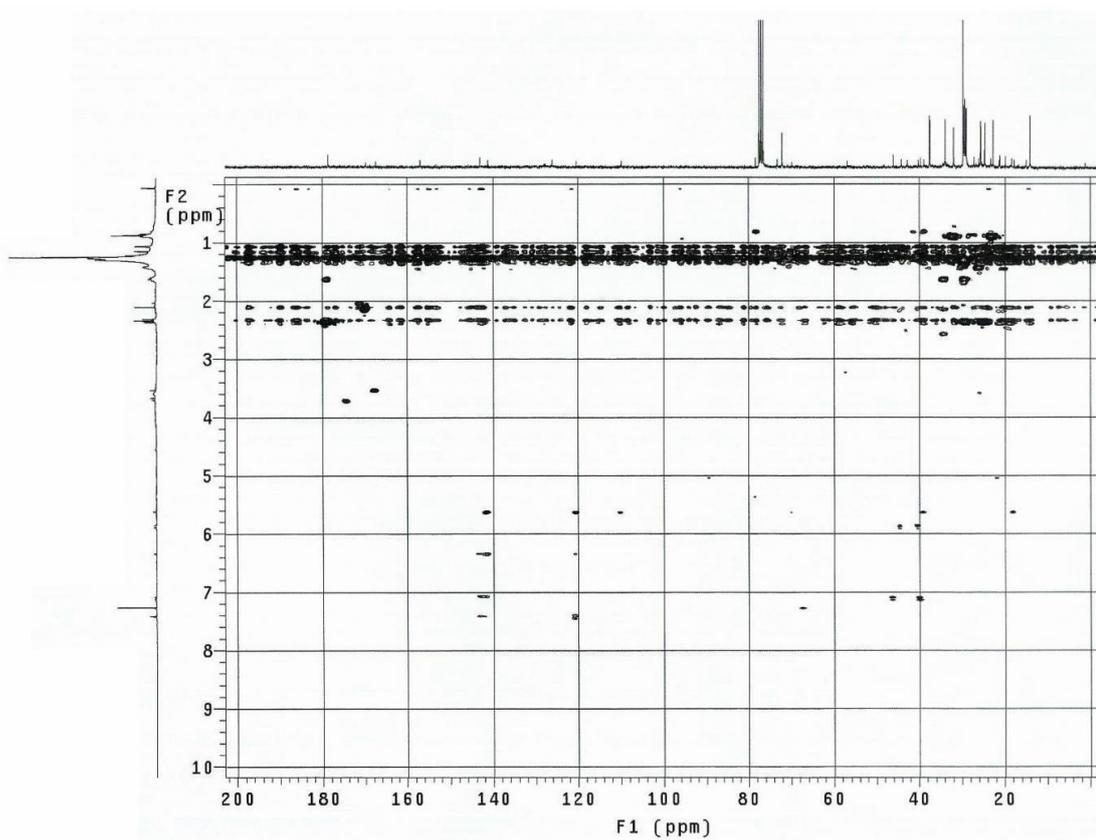


Figure S1C – Spectra of NMR 2D – HETCOR and HMBC from gedunin.

HETCOR



HMBC



SECTION S2

Figure S2A – Spectrum of NMR ^1H from 6 α -acetoxygedunin.

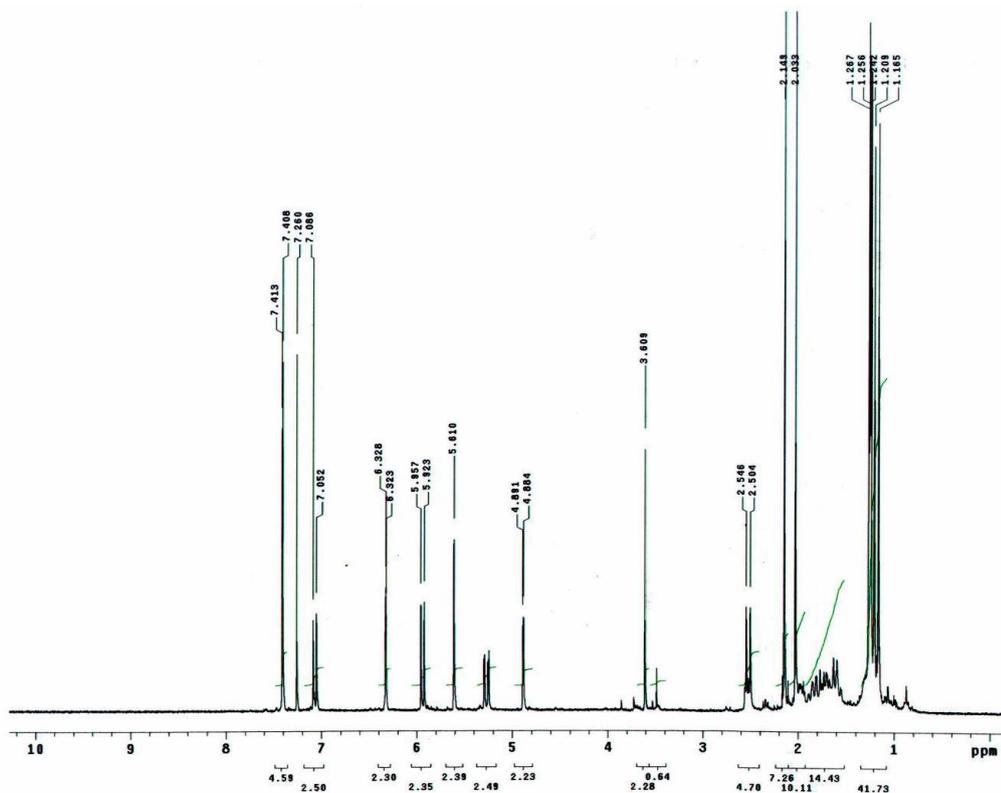


Figure S2B – Spectrum of NMR ^{13}C from 6 α -acetoxygedunin.

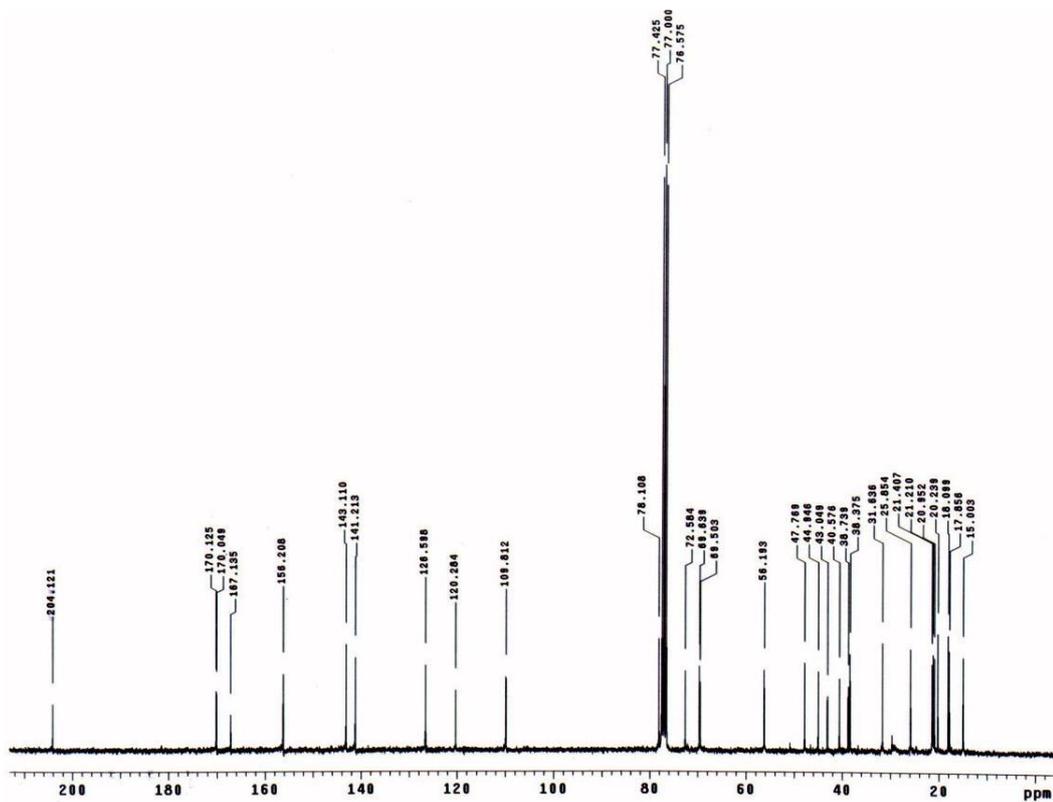
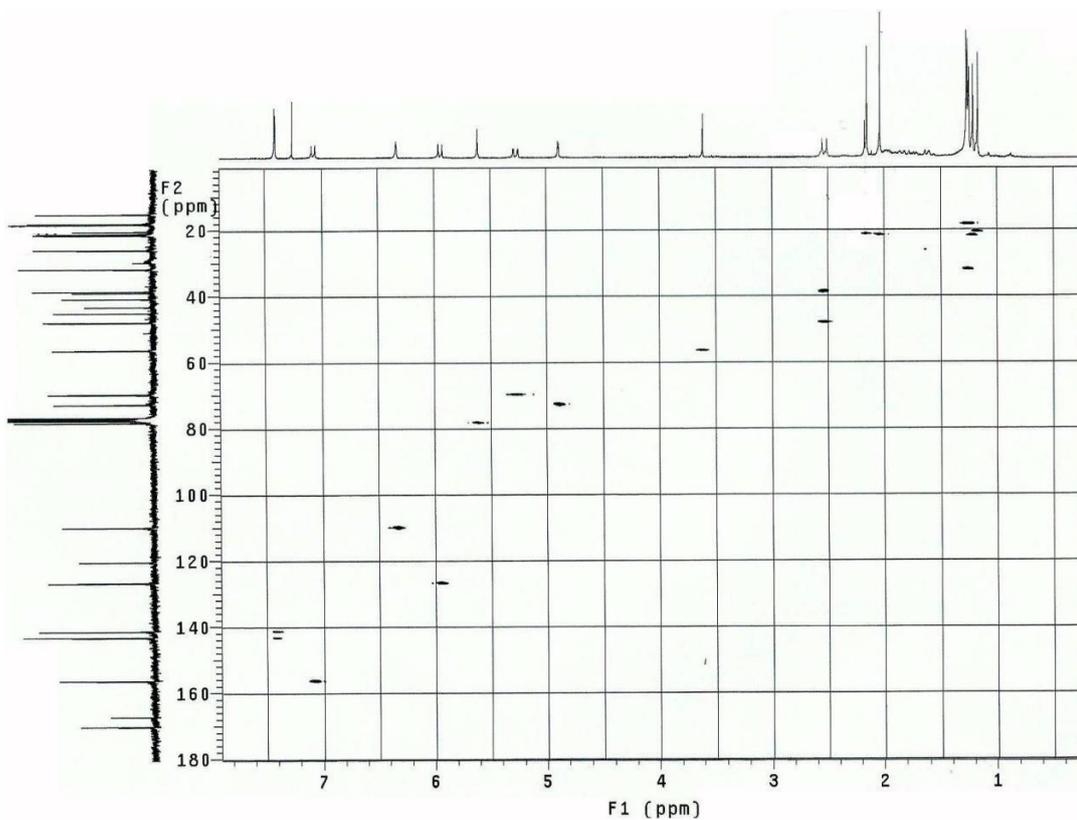
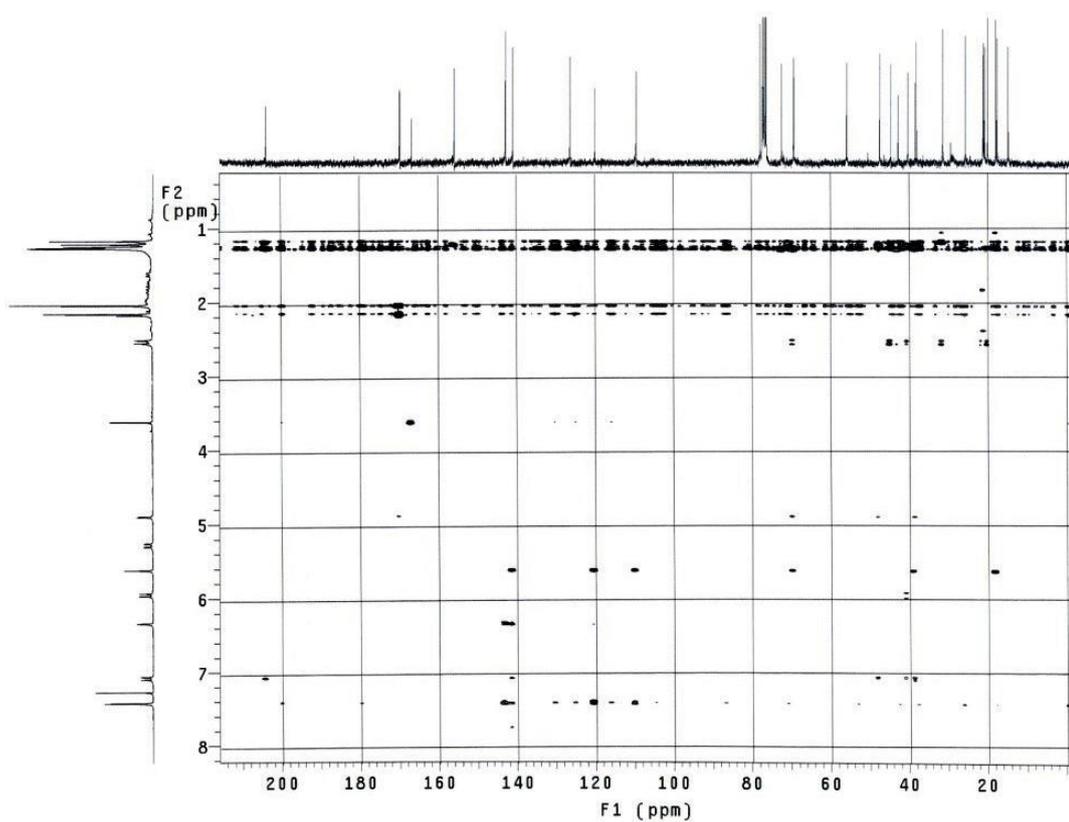


Figure S2C – Spectra of NMR 2D – HETCOR and HMBC from 6 α -acetoxygedunin.

HETCOR



HMBC



SECTION S3

Figure S3A – Spectrum of NMR ^1H from 7-deacetoxy-7-oxogedunin.

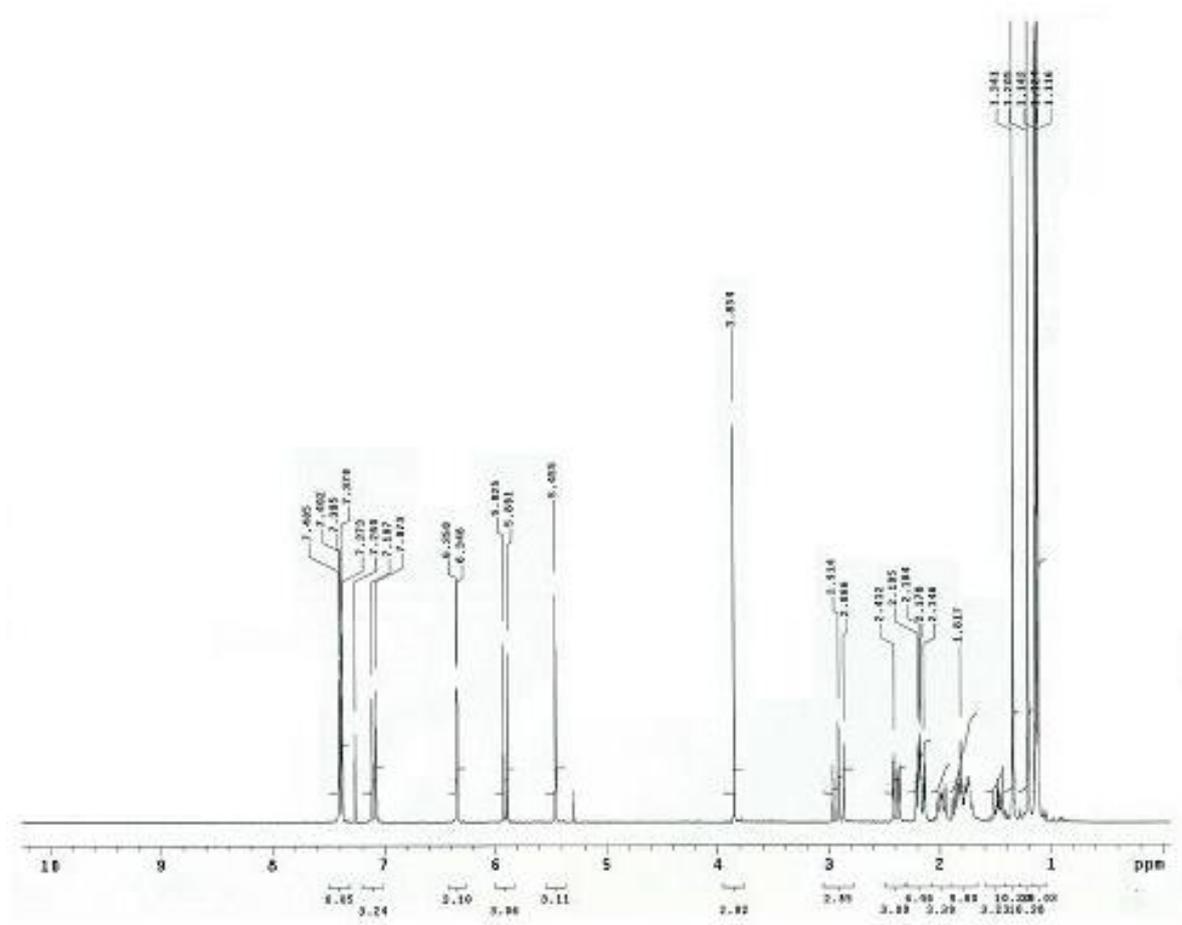


Figure S3B – Spectrum of NMR ^{13}C from 7-deacetoxy-7-oxogedunin.

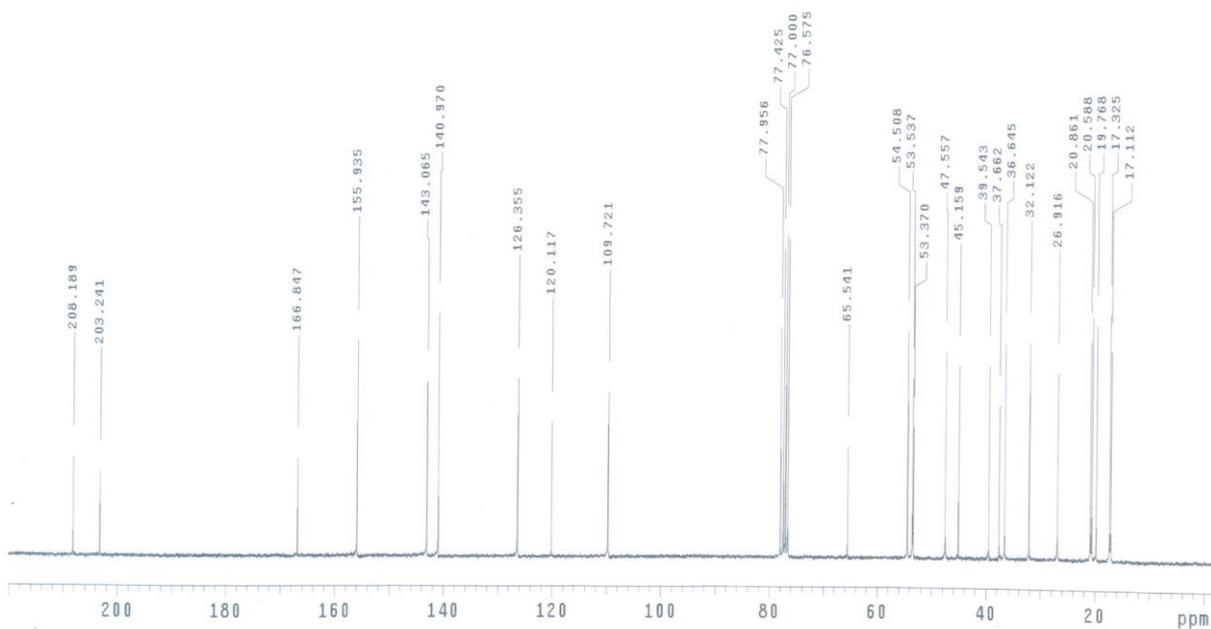
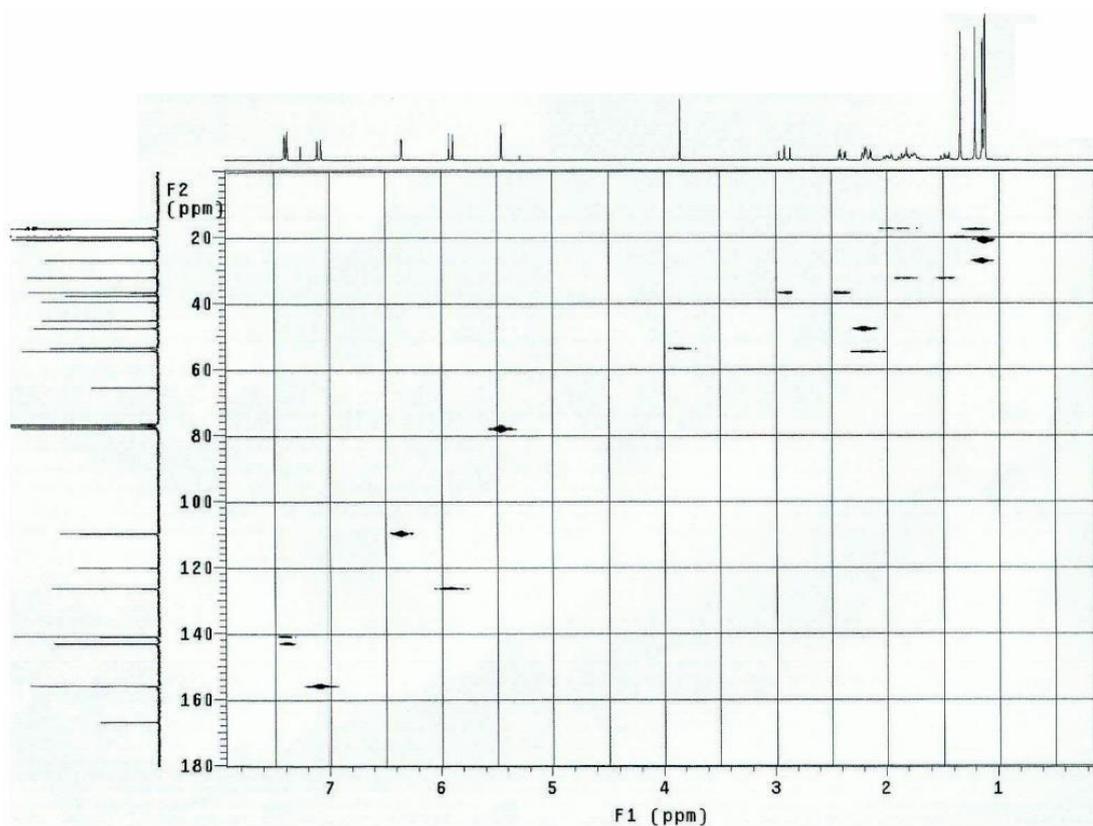
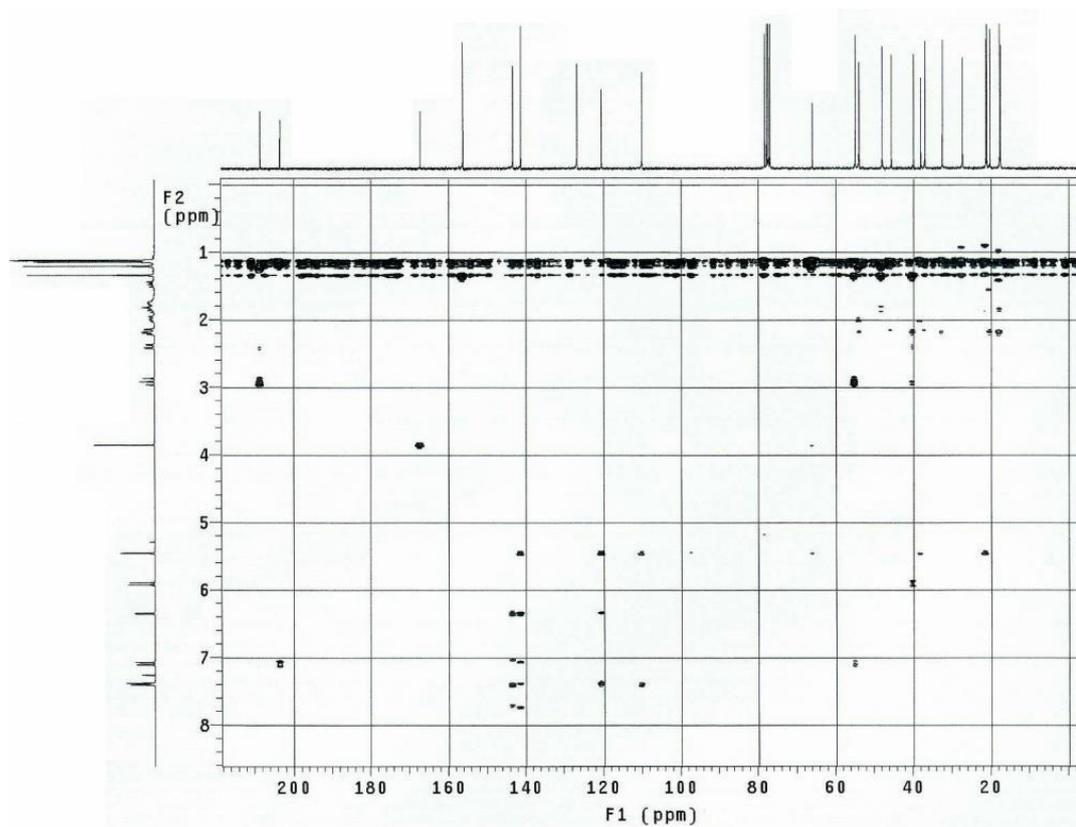


Figure S3C – Spectra of NMR 2D – HETCOR and HMBC from 7-deacetoxy-7-oxogedunin.

HETCOR



HMBC



SECTION S4

Figure S4A – Spectrum of NMR ^1H from Oleanolic acid 3-O-[α -L-ramnopyranosyl-(1 \rightarrow 2)- α -L-arabinopyranosyl].

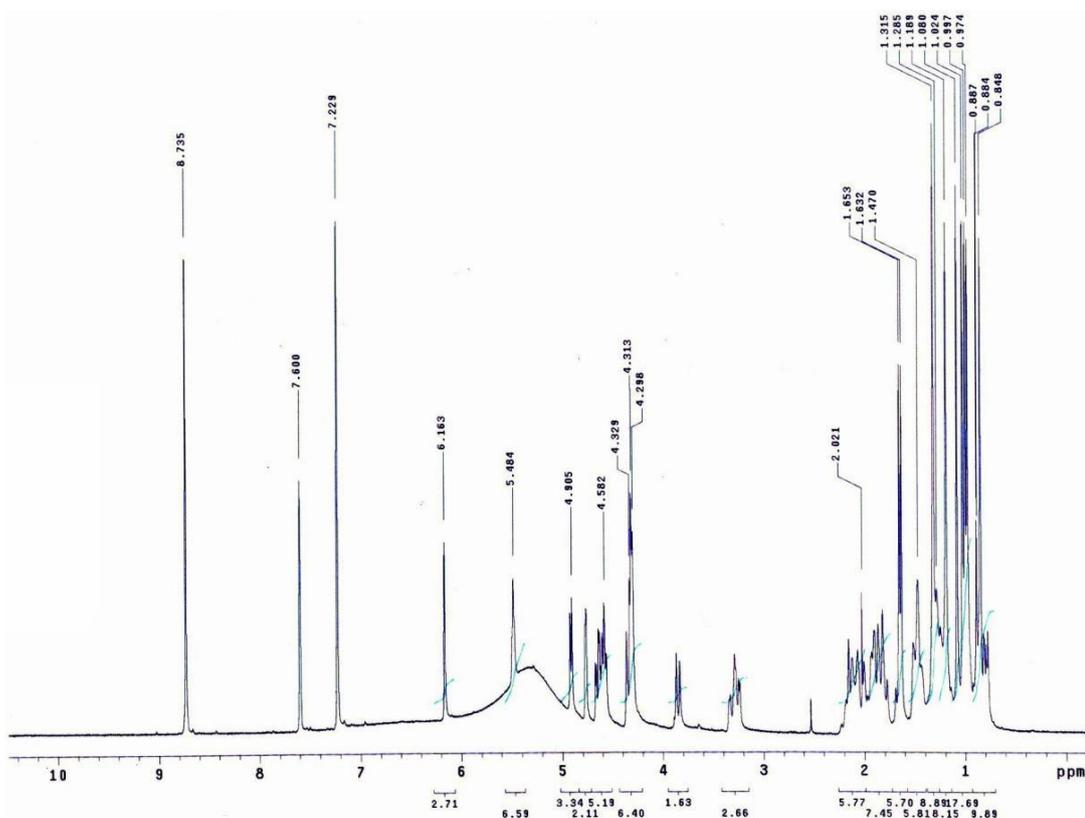


Figure S4B – Spectrum of NMR ^{13}C from Oleanolic acid 3-O-[α -L-ramnopyranosyl-(1 \rightarrow 2)- α -L-arabinopyranosyl].

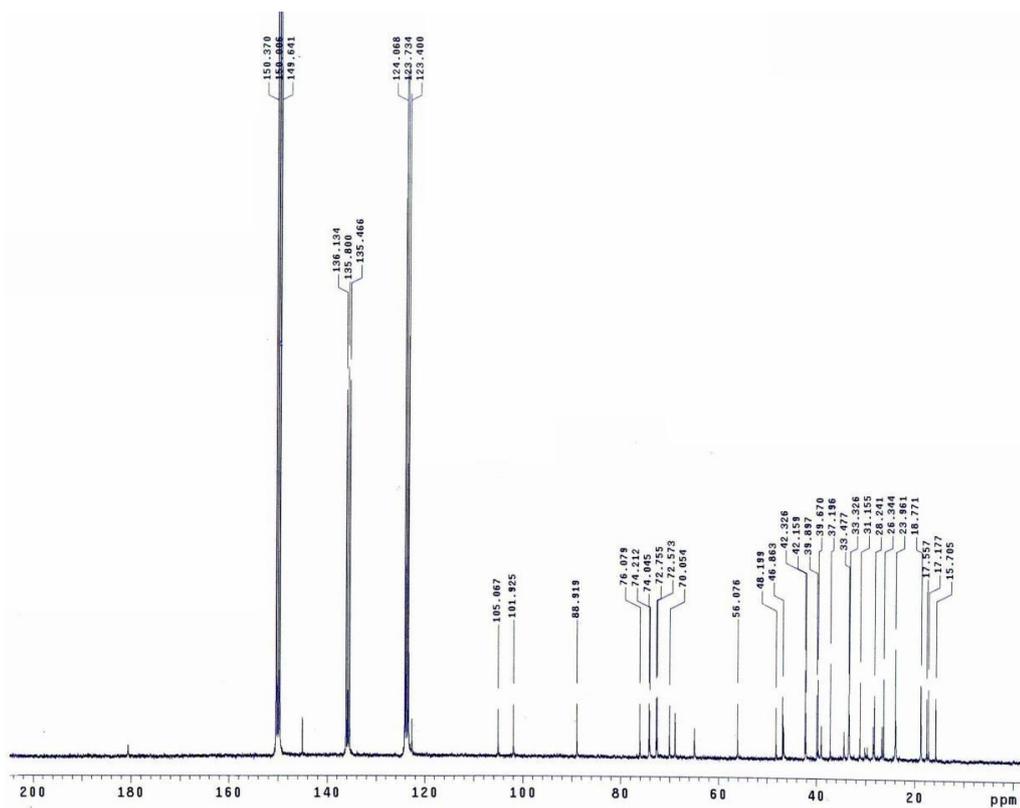
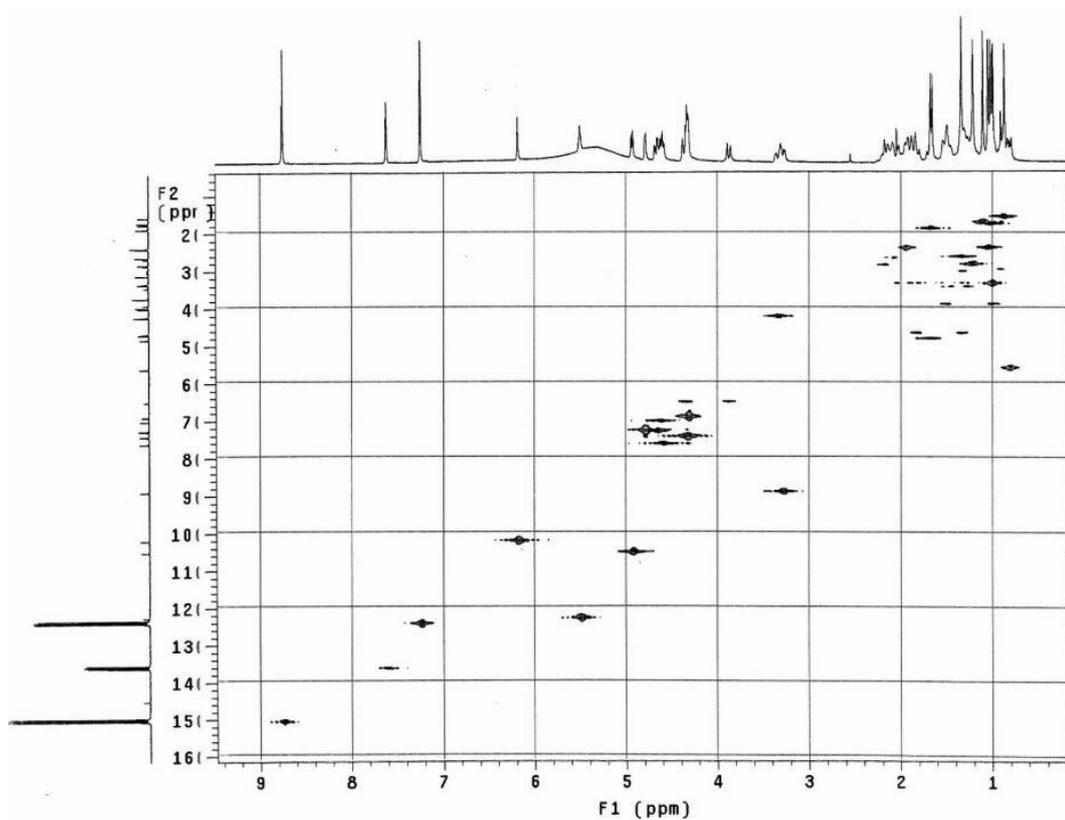
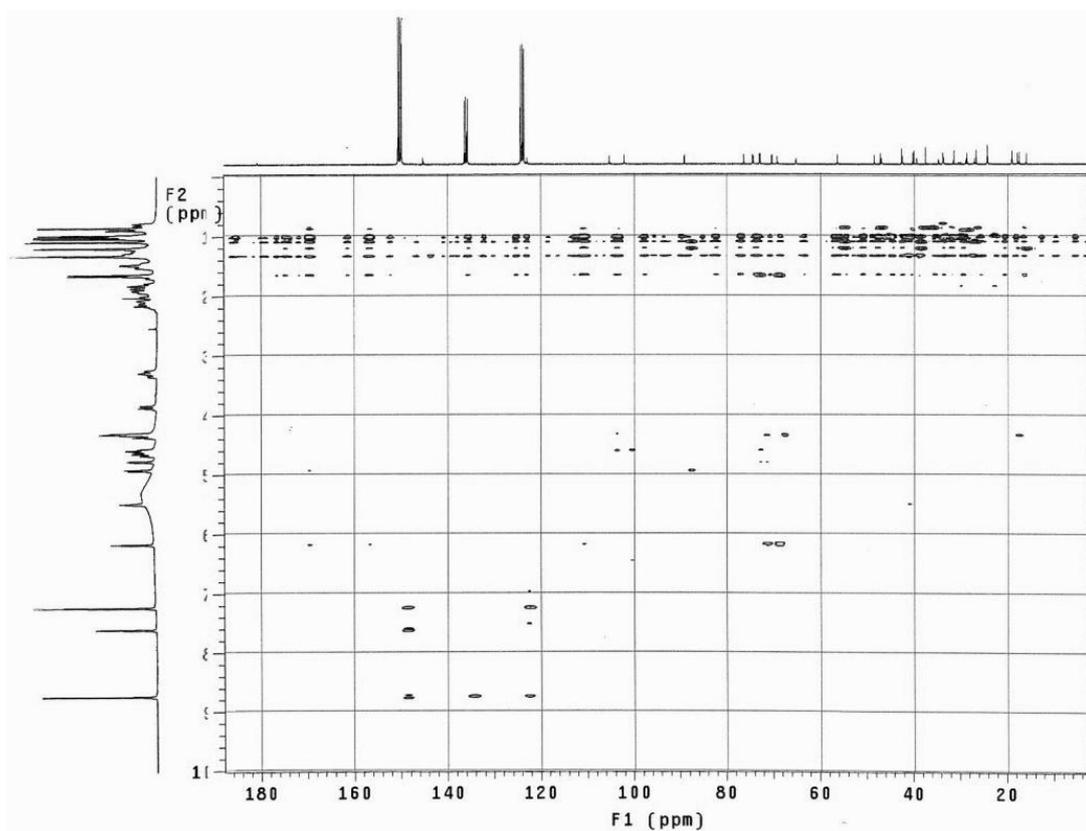


Figure S4C – Spectra of NMR 2D – HETCOR and HMBC from Oleanolic acid 3-O-[α -L-ramnopyranosyl-(1 \rightarrow 2)- α -L-arabinopyranosyl].

HETCOR



HMBC



SECTION S5

Figure S5A – Spectrum of NMR ^1H from Hederagenin 3-O-[α -L- rhamnopyranosyl-(1 \rightarrow 2)- α -L- arabinopyranosyl].

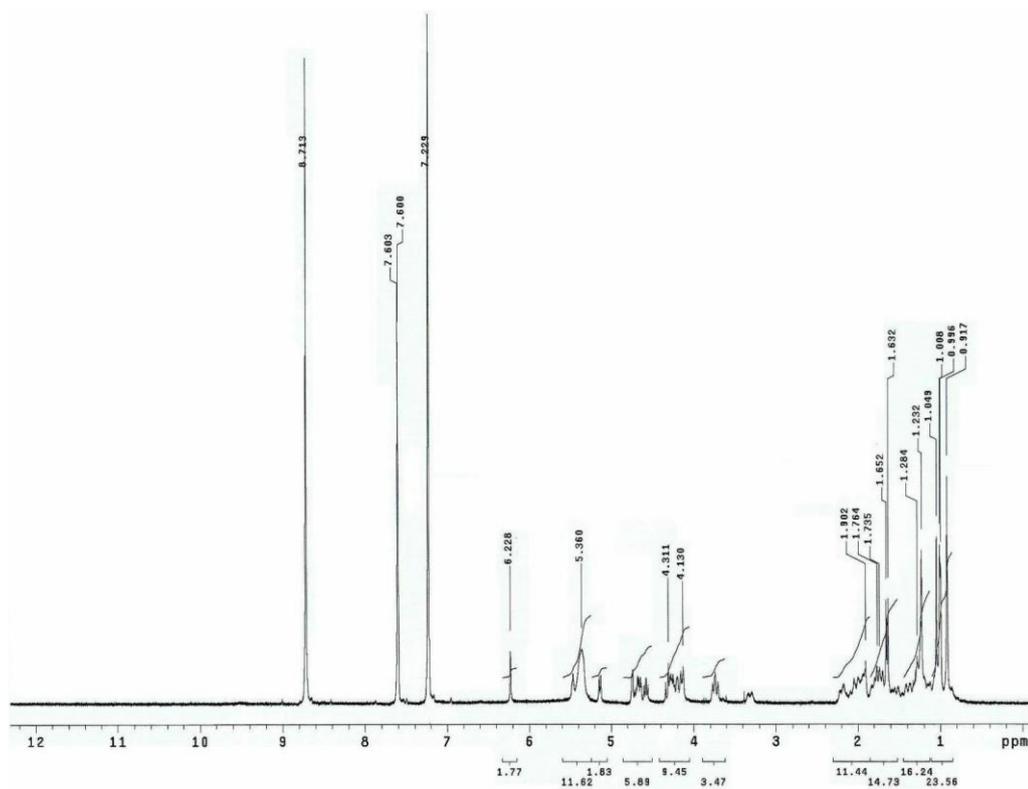


Figure S5B – Spectrum of NMR ^{13}C from Hederagenin 3-O-[α -L- rhamnopyranosyl-(1 \rightarrow 2)- α -L- arabinopyranosyl].

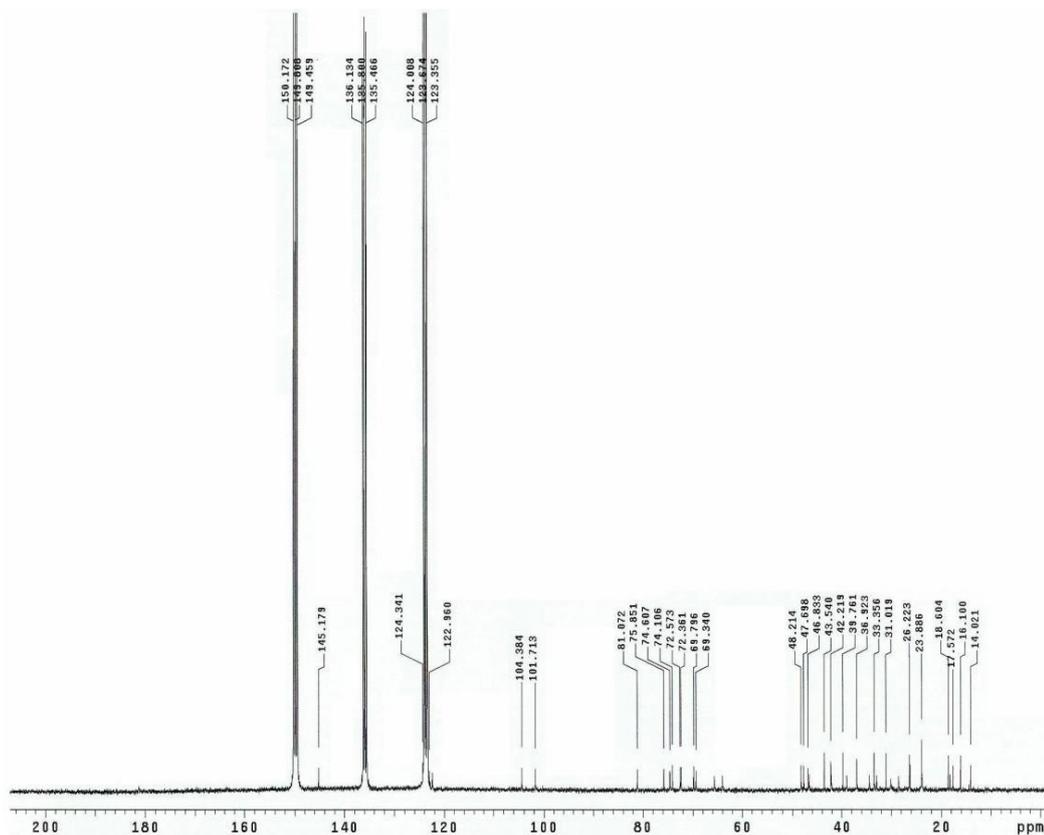
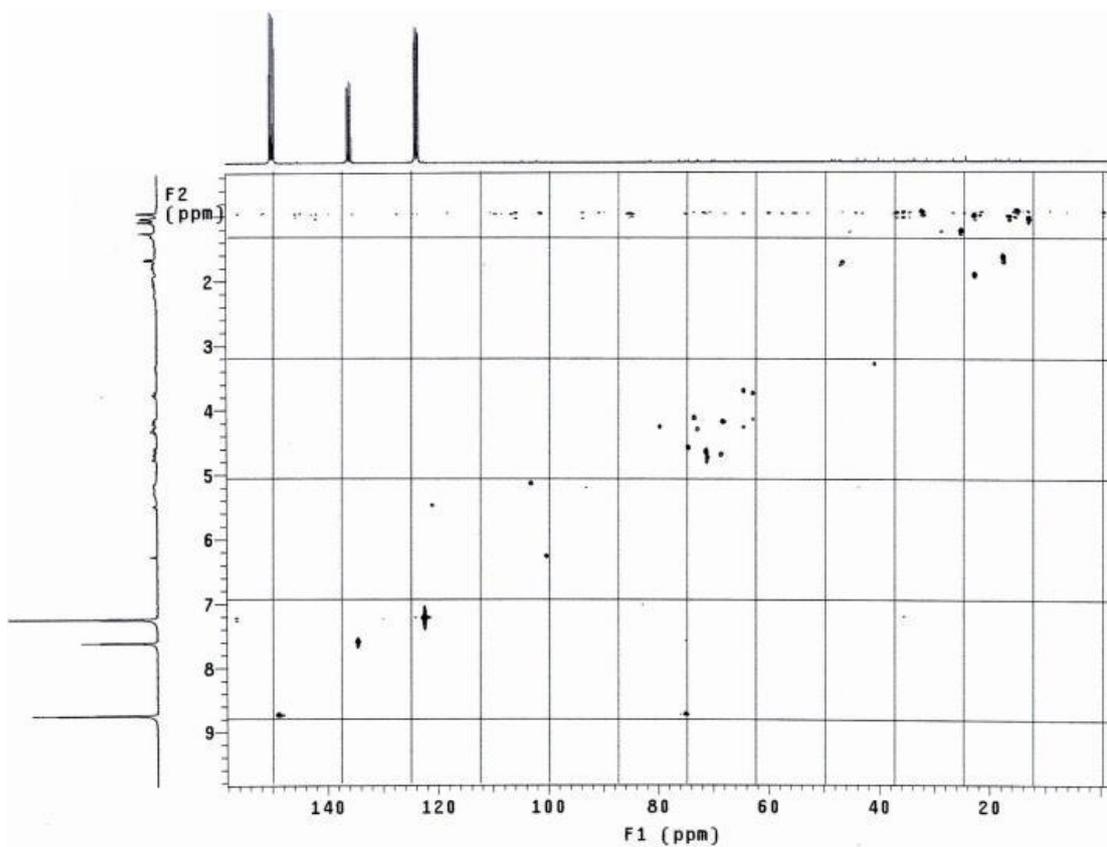


Figure S5C – Spectra of NMR 2D – HSQC and HMBC from Hederagenin 3-O-[α -L- rhamnopyranosyl-(1 \rightarrow 2)- α -L-arabinopyranosyl].

HSQC



HMBC

