Development of an international database, "Natural Product Chemical Ingredients" for collaborating data of ingredients in natural products

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Abstract

An international database, "Natural Product Chemical Ingredients" (NPCI) was developed for collaborating data of ingredients in natural products. The website uniform resource locator (url) address is http://npci.selfip.org . Anyone can post ingredients or compounds from natural products to this database collaborately with others through the internet so that anyone can find out the types and quantities of ingredients compose natural products througth the database.

Keywords: NPCI, Database, natural products, chemical, ingredients, international, plant, animal, mineral

Introduction

An international database, "Natural Product Chemical Ingredients" (NPCI) was developed for collaborating data of ingredients in natural products. The website uniform resource locator (url) address is http://npci.selfip.org . Anyone can post ingredients or compounds from natural products to this database collaborately with others through the internet so that anyone can find out what ingredients compose a specific natural product and which natural products have a specific ingredient easier and more convenient. In addition, anyone can find out the content of ingredients in a specific natural product and the content of a specific ingredient in natural products througth the database.

The interface was showed in figure 1. There were six operating links at the frontpage of website.

The first link aims for anyone who wants to post an ingredients or compounds that can be found in this database with scientific publications. This means if a journal shows the isolation of an ingredient from a natural product, it is possible to click this link for posting the ingredient.

The second link aims for anyone who wants to find out what ingredients compose a specific natural product.

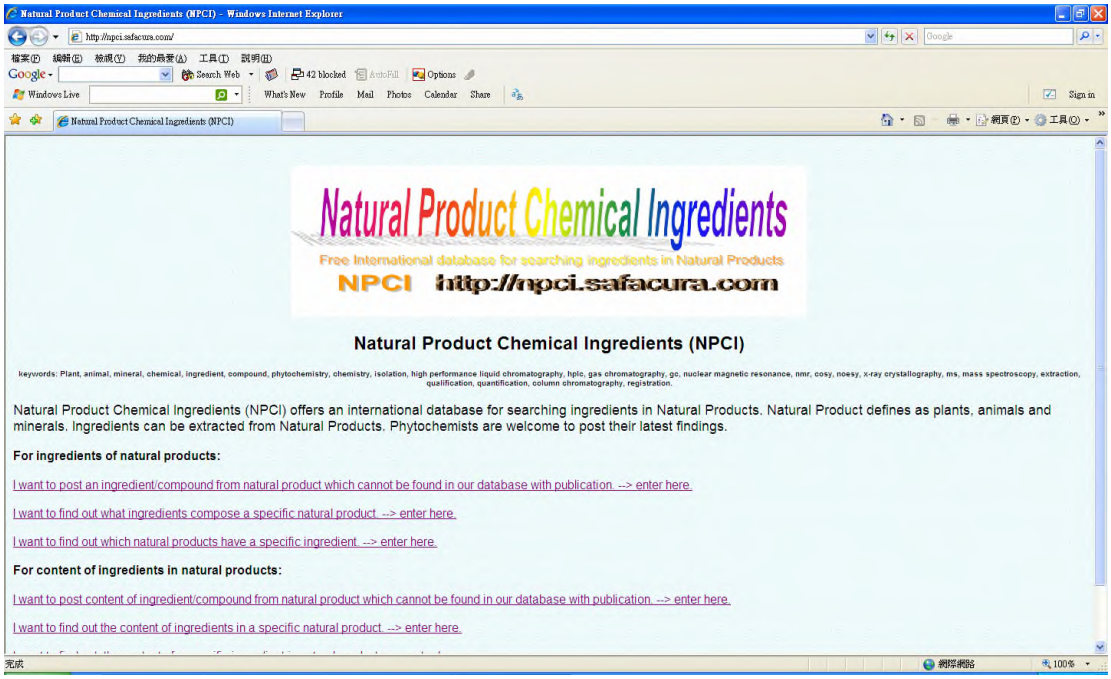
The third link aims for anyone who wants to find out which natural products have a specific ingredient.

The forth link aims for anyone who wants to post content of an ingredient or compound from natural products in which the content cannot be found in this database with scientific publication. This means if a journal shows the determination of the content of an ingredient in a natural product is found, it is possible to click this link for posting the content of ingredient.

The fifth link aims for anyone who wants to find out the content of ingredients in a specific natural product.

The sixth link aims for anyone who wants to find out the content of a specific ingredient in various natural products.

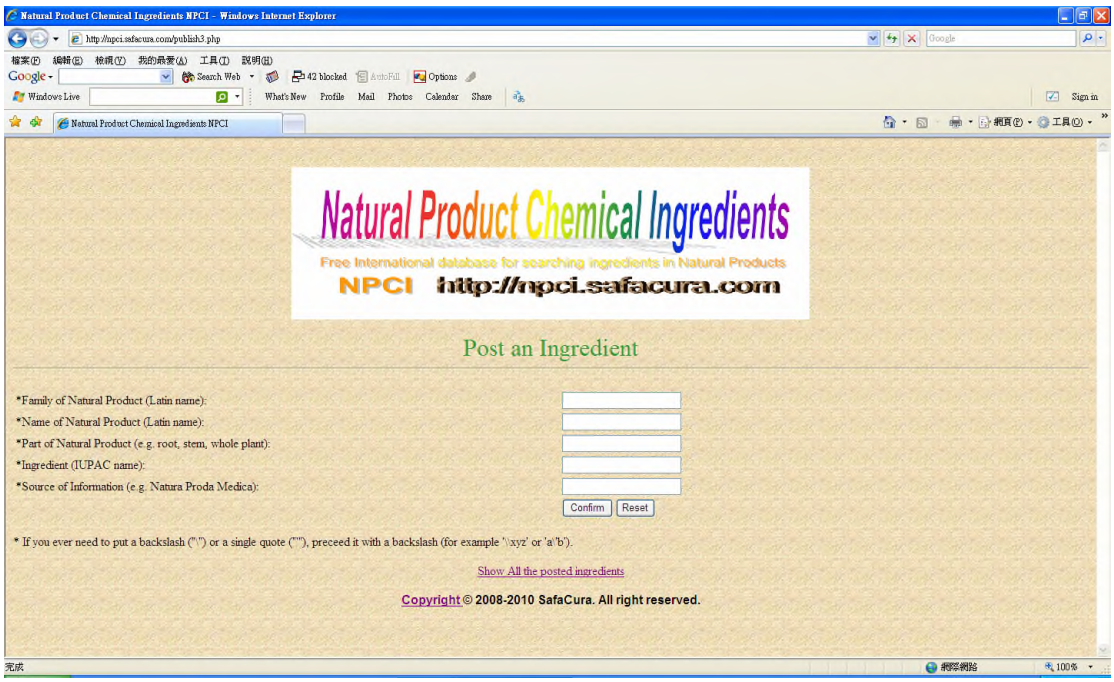
Figure 1. The frontpage of NPCI.



Click of first link. To post an ingredient/compound from a natural product

Figure 2 shows the interface after clicking the first link. Anyone can post an ingredient/compound from a natural product at this page. There were five fields at the page. The first field should fill into the family of natural product. The second should fill into the name of natural product. The third should fill into the part of natural product, e.g. root, shoot, etc. The forth should fill in to the name of ingredient isolated from natural product. The fifth should fill into the source of finding the isolation of ingredient from natural product.

Figure 2. The interface after clicking the first link



A journal "Javed Intekhab; Mohammad Aslam. Isolation of 5,6,7,8,3',5'-hexamethoxy flavanone-4'-α-L-rhamnopyranoside, a Flavanone Glucoside from Feronia Limonia. *Natura Proda Medica*, **2010**, 3: 81-83." was used as an example. "Rutaceae" filled into the first field. "Fexonia limonia" filled into the second field. "Roots and stems" filled into the third field. "5,6,7,8,3\',5\'-hexamethoxy flavanone-4\'-α-L-rhamnopyranoside" filled into the forth field. "Javed Intekhab; Mohammad Aslam. Isolation of 5,6,7,8,3\',5\'-hexamethoxy flavanone-4\'-α-L-rhamnopyranoside, a Flavanone Glucoside from Feronia Limonia. *Natura Proda Medica*, **2010**, 3: 81-83." filled into the fifth field. "Confirm" button was clicked as shown in figure 2.1. The results posted at the bottom of page as shown in figure 2.2. It should be reminded if a backslash ("\") or a single quote (""") was needed to be filled into the field, preceed it with a backslash (for example '\\xyz' or 'a\'b').

Figure 2.1. An example of filling into the fields of Post an Ingredient.

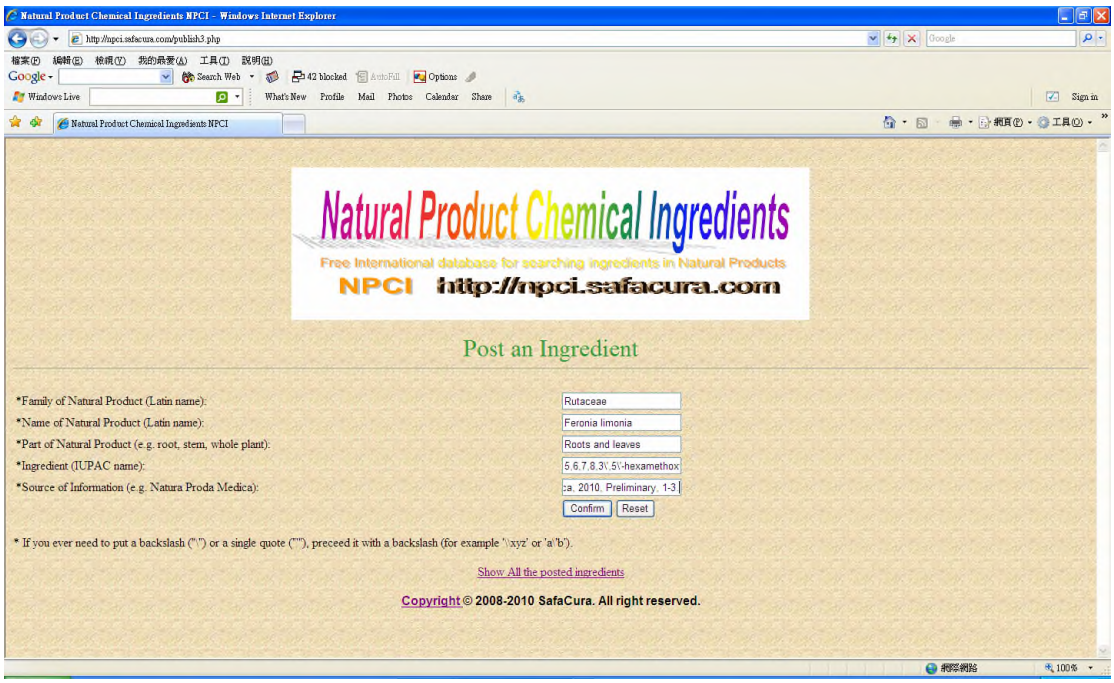
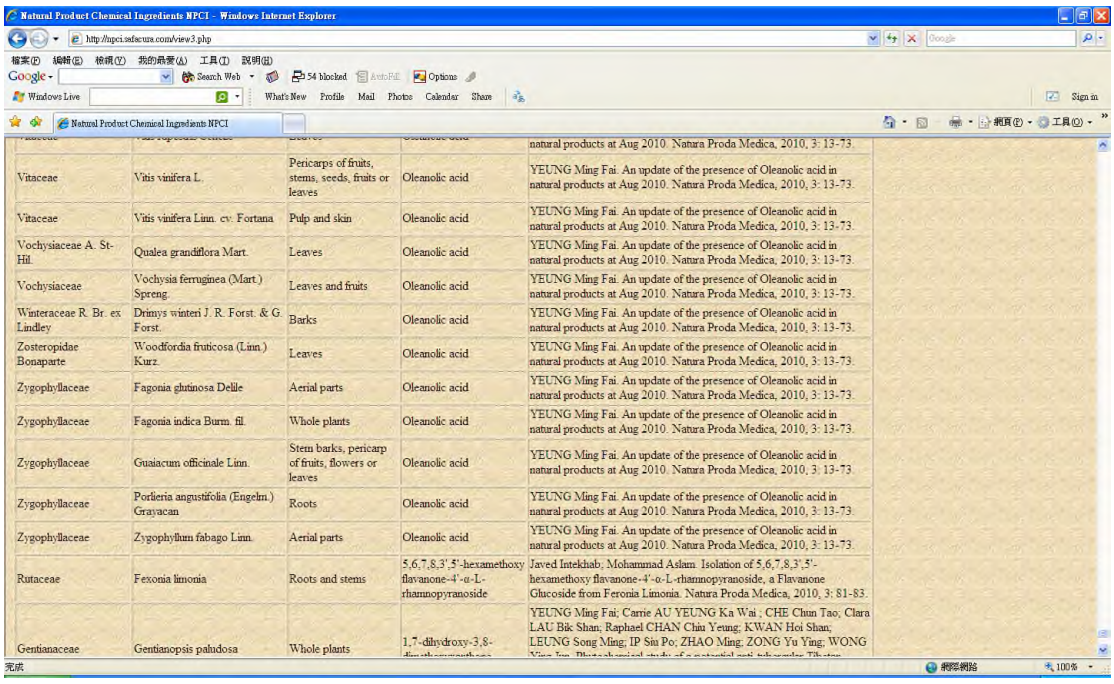
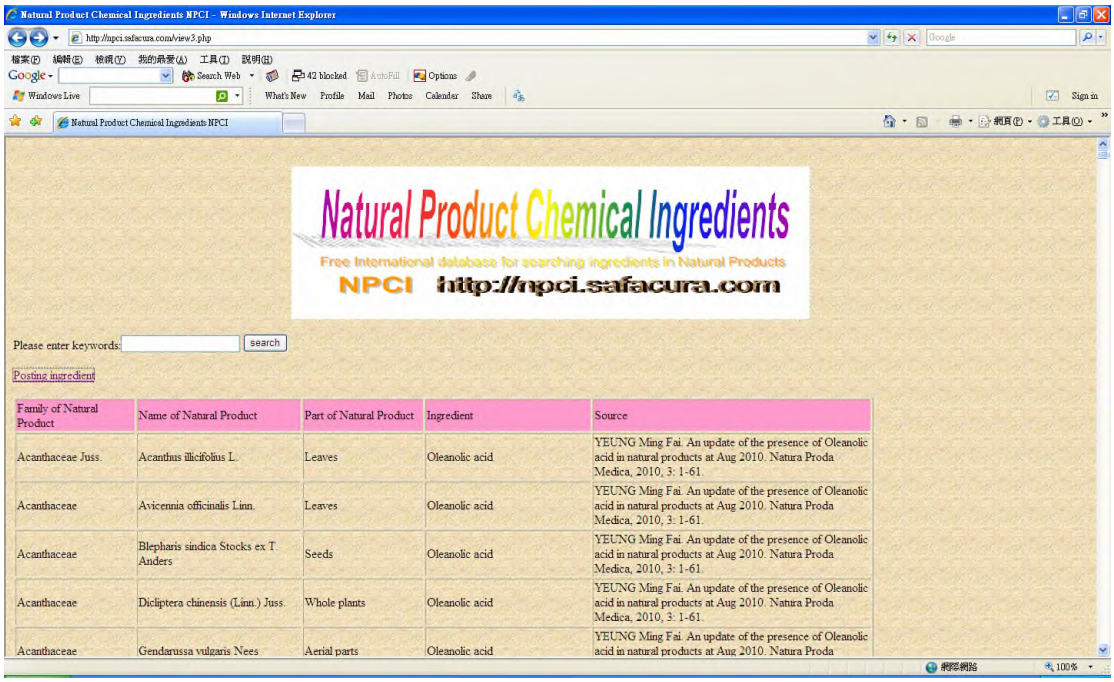


Figure 2.2 An example after filling into the fields of Post an Ingredient and clicking the confirm button.



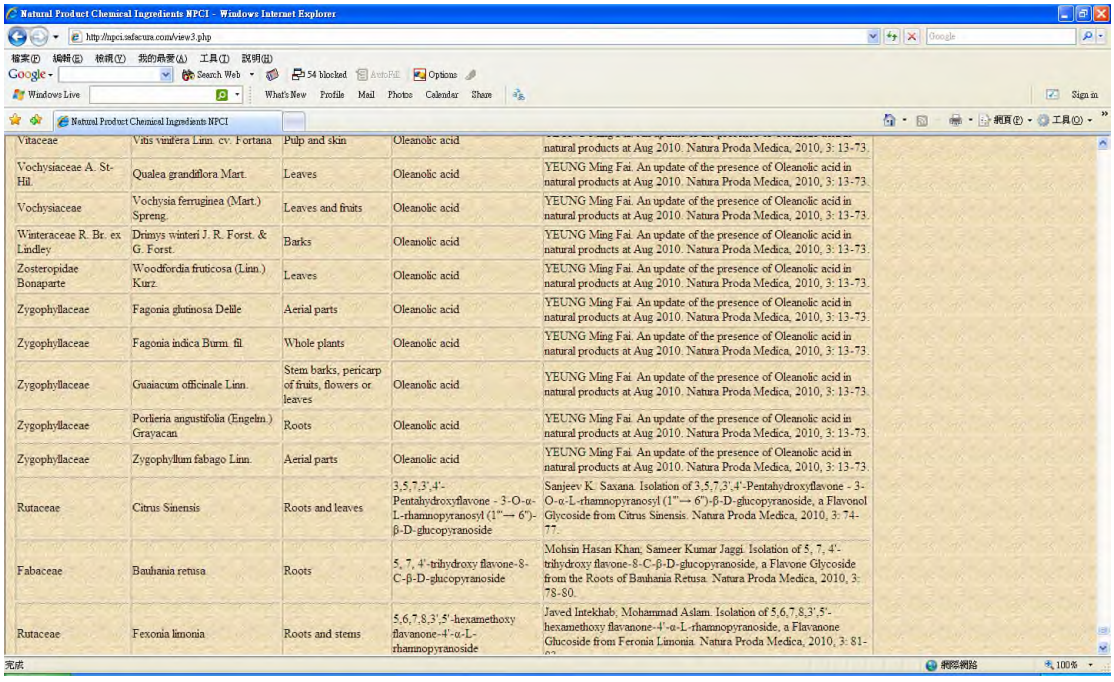
If another ingredient is wanted to be posted, click the link "Posting ingredient" at the top of interface as shown in figure 2.3。This directed the interface to figure 2.1 again for posting other ingredients. Examples of"Mohsin Hasan Khan; Sameer Kumar Jaggi. Isolation of 5, 7, 4'-trihydroxy flavone-8-C-β-D-glucopyranoside, a Flavone Glycoside from the Roots of Bauhania Retusa. *Natura Proda Medica*, **2010**, 3: 78-80." and "Sanjeev K. Saxana. Isolation of 3,5,7,3',4'-Pentahydroxyflavone - 3-O-α-L-rhamnopyranosyl (1'"→ 6")-β-D-glucopyranoside, a Flavonol Glycoside from Citrus Sinensis. *Natura Proda Medica*, **2010**, 3: 74-77." were used. After submitting the information, the results were shown in figure 2.4.

Figure 2.3 The top of interface showing the results after posting an ingredient from a natural product.



Family of Natural Product	Name of Natural Product	Part of Natural Product	Ingredient	Source
Acanthaceae Juss.	Acanthus illicifolius L.	Leaves	Oleanolic acid	YEUNG Ming Fai. An update of the presence of Oleanolic acid in natural products at Aug 2010. Natura Proda Medica, 2010, 3: 1-61.
Acanthaceae	Avicennia officinalis Linn.	Leaves	Oleanolic acid	YEUNG Ming Fai. An update of the presence of Oleanolic acid in natural products at Aug 2010. Natura Proda Medica, 2010, 3: 1-61.
Acanthaceae	Blepharis sindica Stocks ex T. Anders	Seeds	Oleanolic acid	YEUNG Ming Fai. An update of the presence of Oleanolic acid in natural products at Aug 2010. Natura Proda Medica, 2010, 3: 1-61.
Acanthaceae	Dicliptera chinensis (Linn.) Juss.	Whole plants	Oleanolic acid	YEUNG Ming Fai. An update of the presence of Oleanolic acid in natural products at Aug 2010. Natura Proda Medica, 2010, 3: 1-61.
Acanthaceae	Gendarussa vulgaris Nees	Aerial parts	Oleanolic acid	YEUNG Ming Fai. An update of the presence of Oleanolic acid in natural products at Aug 2010. Natura Proda

Figure 2.4 The interface after posting the example of ingredients from natural products.



Vitaceae	Vitis vinifera Linn. cv. Fortana	Pulp and skin	Oleanolic acid	natural products at Aug 2010. Natura Proda Medica, 2010, 3: 13-73.
Vochysiaceae A. St-Hil.	Qualea grandiflora Mart.	Leaves	Oleanolic acid	YEUNG Ming Fai. An update of the presence of Oleanolic acid in natural products at Aug 2010. Natura Proda Medica, 2010, 3: 13-73.
Vochysiaceae	Vochysia ferruginea (Mart.) Spreng.	Leaves and fruits	Oleanolic acid	YEUNG Ming Fai. An update of the presence of Oleanolic acid in natural products at Aug 2010. Natura Proda Medica, 2010, 3: 13-73.
Winteraceae R. Br. ex Lindley	Drimys winteri J. R. Forst. & G. Forst.	Barks	Oleanolic acid	YEUNG Ming Fai. An update of the presence of Oleanolic acid in natural products at Aug 2010. Natura Proda Medica, 2010, 3: 13-73.
Zosteropidae Bonaparte	Woodfordia fruticosa (Linn.) Kurz.	Leaves	Oleanolic acid	YEUNG Ming Fai. An update of the presence of Oleanolic acid in natural products at Aug 2010. Natura Proda Medica, 2010, 3: 13-73.
Zygophyllaceae	Fagonia glutinosa Delile	Aerial parts	Oleanolic acid	YEUNG Ming Fai. An update of the presence of Oleanolic acid in natural products at Aug 2010. Natura Proda Medica, 2010, 3: 13-73.
Zygophyllaceae	Fagonia indica Burm. fil.	Whole plants	Oleanolic acid	YEUNG Ming Fai. An update of the presence of Oleanolic acid in natural products at Aug 2010. Natura Proda Medica, 2010, 3: 13-73.
Zygophyllaceae	Guaiacum officinale Linn.	Stem barks, pericarp of fruits, flowers or leaves	Oleanolic acid	YEUNG Ming Fai. An update of the presence of Oleanolic acid in natural products at Aug 2010. Natura Proda Medica, 2010, 3: 13-73.
Zygophyllaceae	Porlieria angustifolia (Engelm.) Grayacan.	Roots	Oleanolic acid	YEUNG Ming Fai. An update of the presence of Oleanolic acid in natural products at Aug 2010. Natura Proda Medica, 2010, 3: 13-73.
Zygophyllaceae	Zygophyllum fabago Linn.	Aerial parts	Oleanolic acid	YEUNG Ming Fai. An update of the presence of Oleanolic acid in natural products at Aug 2010. Natura Proda Medica, 2010, 3: 13-73.
Rutaceae	Citrus Sinensis	Roots and leaves	3,5,7,3',4'-Pentahydroxyflavone - 3-O-α-L-rhamnopyranosyl (1'"→ 6")-β-D-glucopyranoside	Sanjeev K. Saxana. Isolation of 3,5,7,3',4'-Pentahydroxyflavone - 3-O-α-L-rhamnopyranosyl (1'"→ 6")-β-D-glucopyranoside, a Flavonol Glycoside from Citrus Sinensis. Natura Proda Medica, 2010, 3: 74-77.
Fabaceae	Bauhania retusa	Roots	5, 7, 4'-trihydroxy flavone-8-C-β-D-glucopyranoside	Mohsin Hasan Khan; Sameer Kumar Jaggi. Isolation of 5, 7, 4'-trihydroxy flavone-8-C-β-D-glucopyranoside, a Flavone Glycoside from the Roots of Bauhania Retusa. Natura Proda Medica, 2010, 3: 78-80.
Rutaceae	Fexonia limonia	Roots and stems	5,6,7,8,3',5'-hexamethoxy flavanone-4'-α-L-rhamnopyranoside	Javed Intekhab; Mohammad Aslam. Isolation of 5,6,7,8,3',5'-hexamethoxy flavanone-4'-α-L-rhamnopyranoside, a Flavanone Glucoside from Feronia Limonia. Natura Proda Medica, 2010, 3: 81-

Click of second link: To find out what ingredients compose a natural product

Figure 3 shows the interface after the second link at the frontpage was clicked. A field called "Please enter keywords" was shown at the top of interface. If you want to know what ingredients compose a Tibetan medicinal plant, *Gentianopsis paludosa*, "Gentianopsis paludosa" was filled into the field as an example. The search results were shown in figure 3.1.

Figure 3. Interface after the second link at the frontpage was clicked.

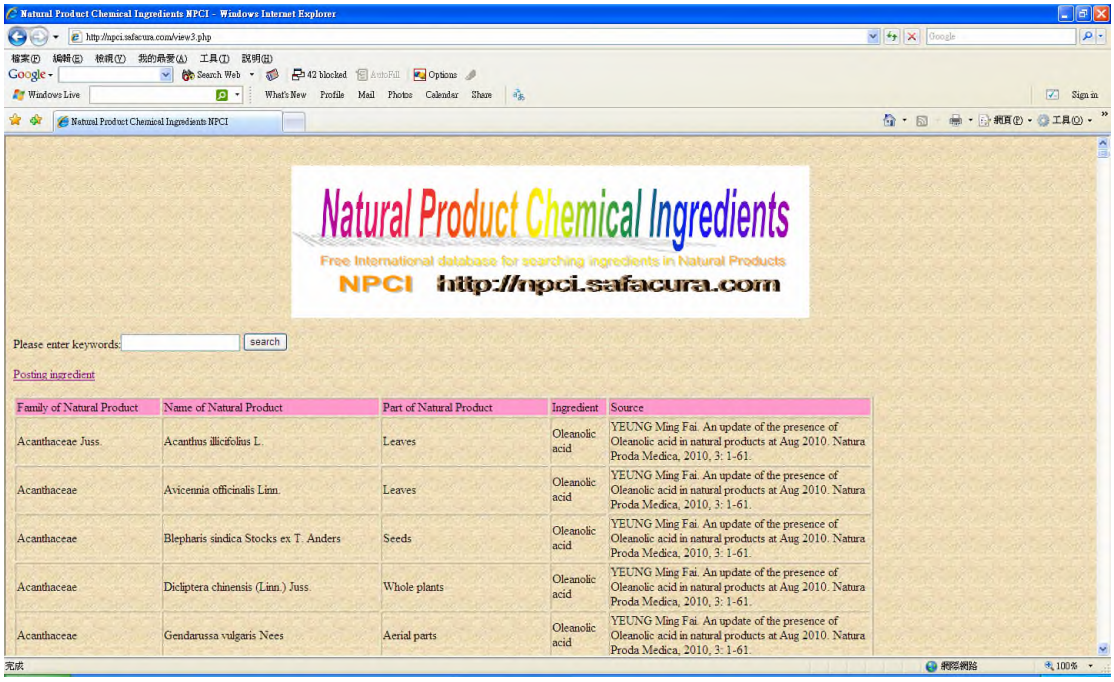
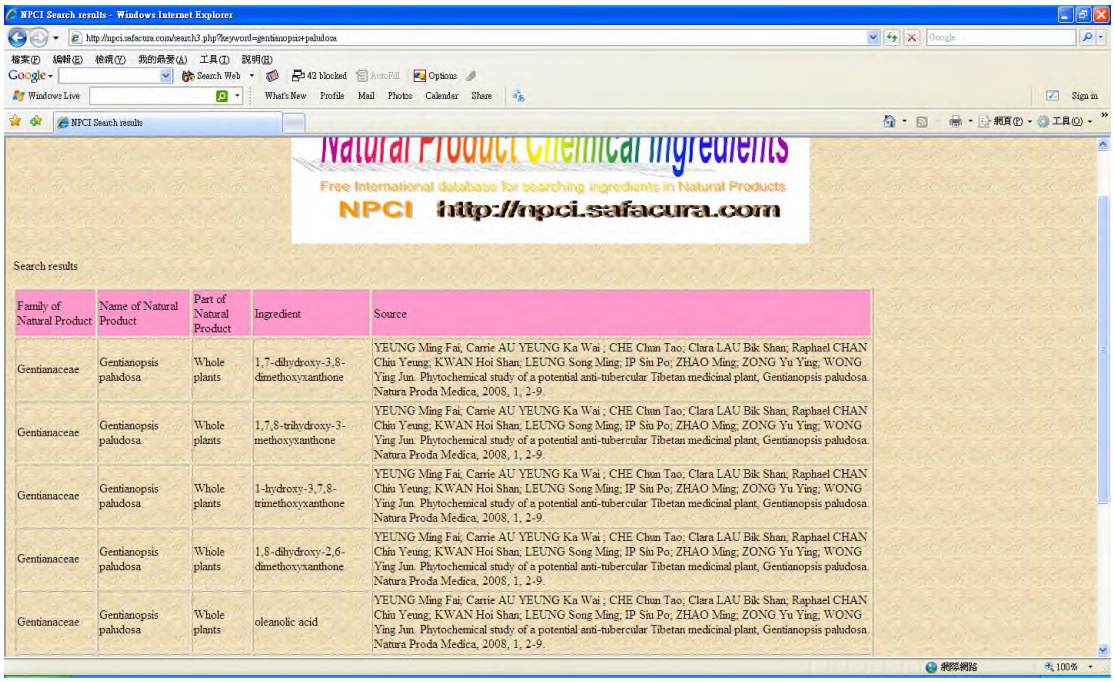


Figure 3.1 Interface shows the search results after filling the keywords with "Gentianopsis paludosa"



Click of third link: To find out which natural products have a specific ingredient

Figure 4 shows the interface after the third link at the frontpage was clicked. A field called "Please enter keywords" was shown at the top of interface. If you want to know which natural products composed oleanolic acid, "oleanolic acid" was filled into the field as an example. The search results were shown in figure 4.1.

Figure 4. Interface after the third link at the frontpage was clicked

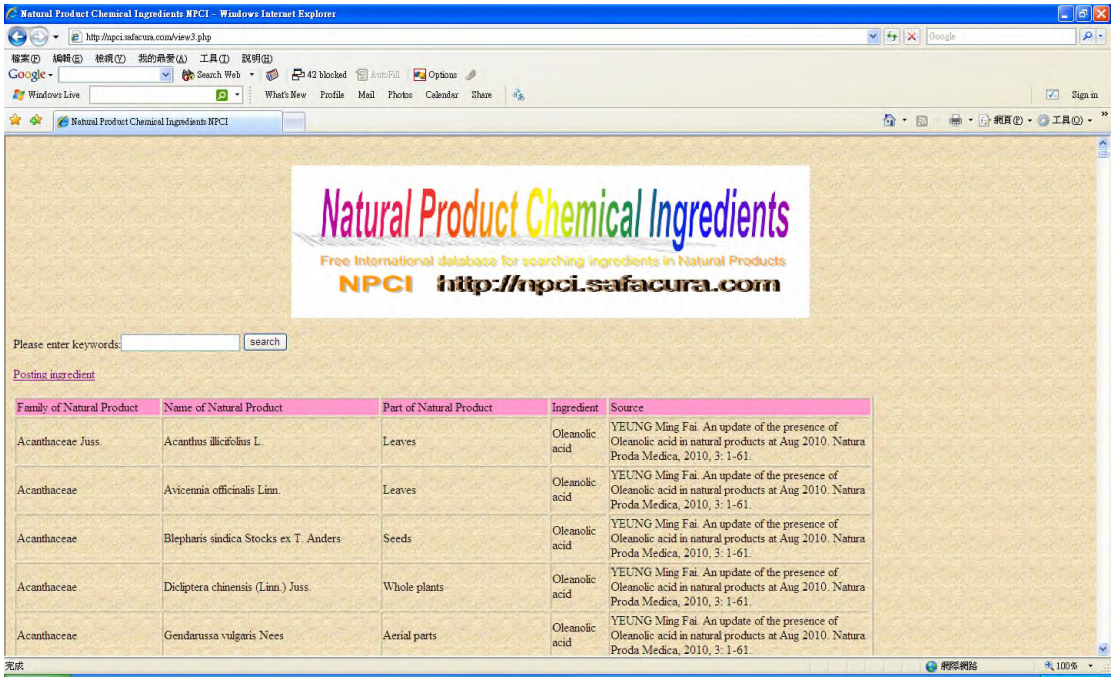
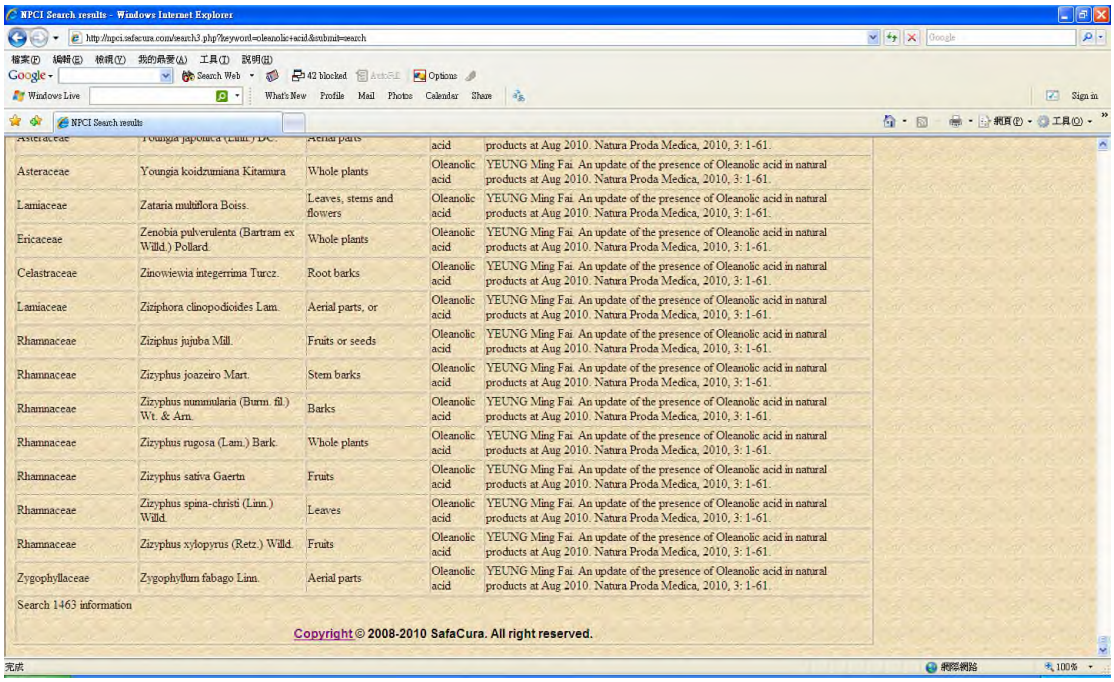


Figure 4.1 Interface showed search results after entered the keywords as "oleanolic acid"



Click of forth link: To post content of ingredient from natural product

Figure 5 shows the interface after clicking the forth link at the frontpage .Anyone can post the content of ingredient/compound from a natural product at this page. There were six fields at the page. The first field should fill into the family of natural product. The second should fill into the name of natural product. The third should fill into the part of natural product, e.g. root, etc. The forth should fill into name of ingredient determined from natural product. The fifth should fill into content of ingredient determined from natural product. The sixth should fill into source of finding the determinated ingredient from natural product.

Figure 5 Interface after the forth link at frontpage was clicked.

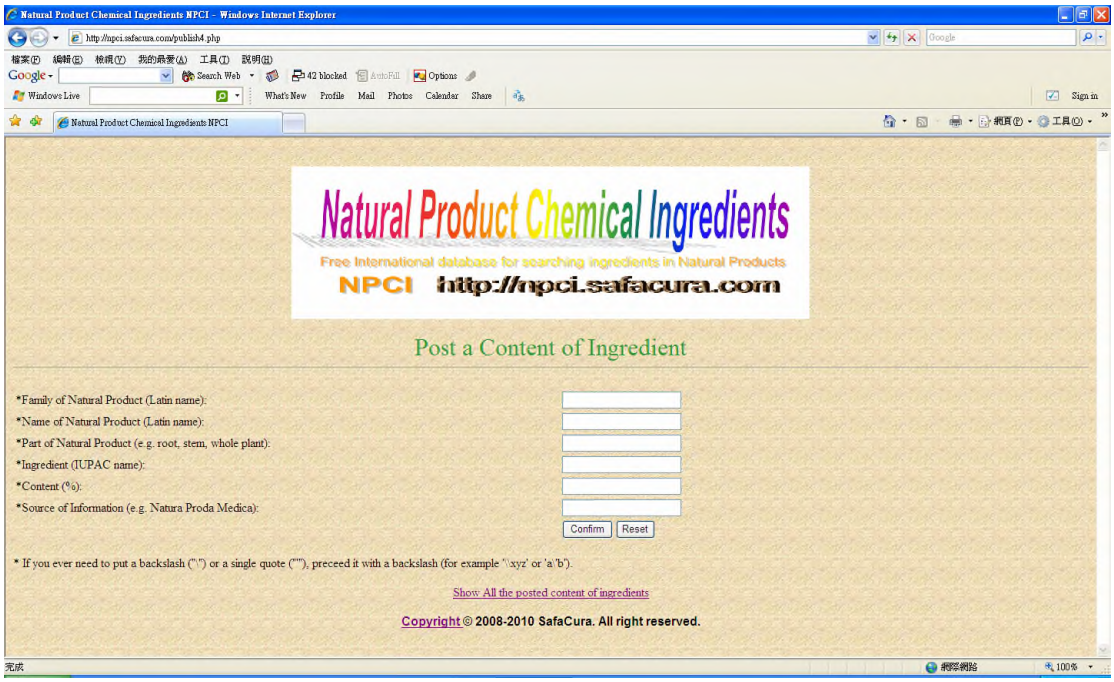
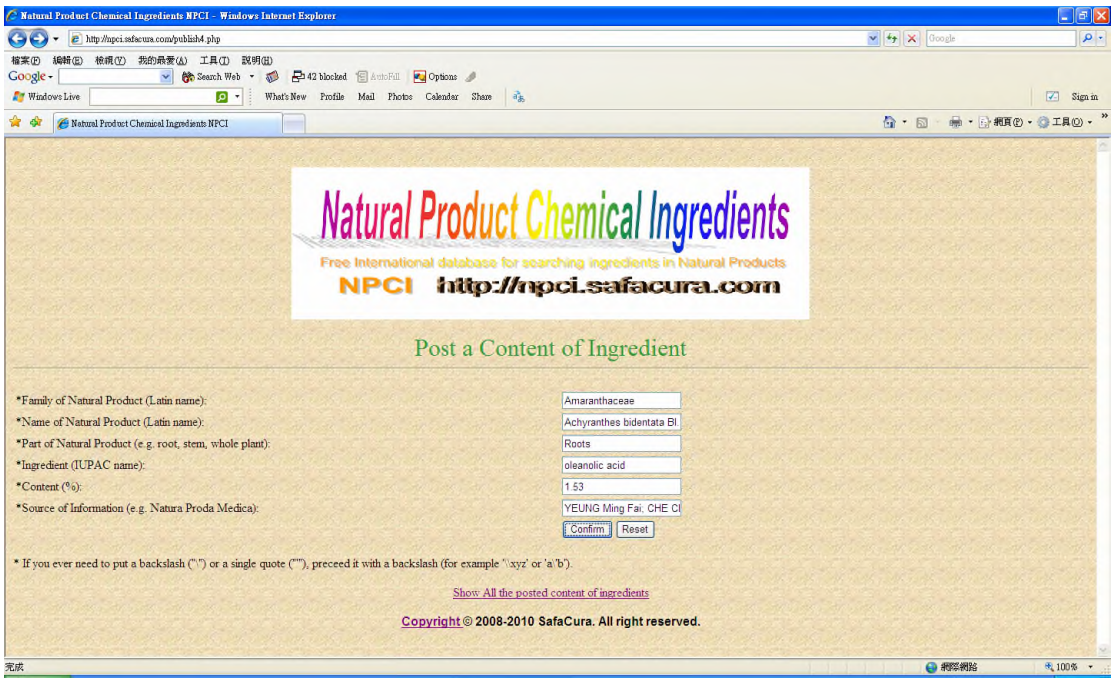
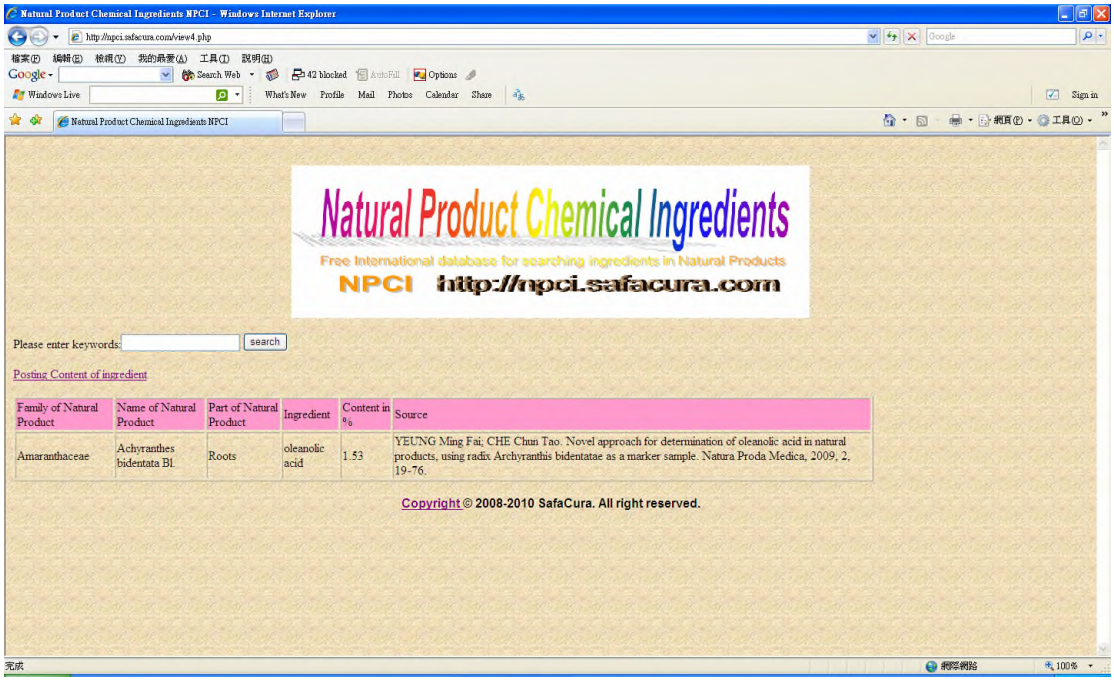


Figure 5.1. An example of filling into the fields of Post a Content of Ingredient.



A journal "YEUNG Ming Fai; CHE Chun Tao. Novel approach for determination of oleanolic acid in natural products, using radix Archyranthis bidentatae as a marker sample. *Natura Proda Medica*, **2009**, 2: 19-76." was used as an example. "Amaranthaceae" filled into the first field. "Achyranthes bidentata Bl." filled into the second field. "Roots" filled into the third field. "oleanolic acid" filled into the forth field. "1.53" filled into the fifth field. "YEUNG Ming Fai; CHE Chun Tao. Novel approach for determination of oleanolic acid in natural products, using radix Archyranthis bidentatae as a marker sample. *Natura Proda Medica*, **2009**, 2: 19-76." filled into the sixth field. "Confirm" button was clicked as shown in figure 5.1. The results posted at the page as shown in figure 5.2. It should be reminded if a backslash ("\") or a single quote ("'") was needed to be filled into the field, preceed it with a backslash (for example '\\xyz' or 'a\'b').

Figure 5.2 An example after filling into the fields of Post Content of Ingredient and clicking the confirm button.



Click of fifth link: To find out content of ingredients in specific natural product

Figure 6 shows the interface after the fifth link at the frontpage was clicked. A field called "Please enter keywords" was shown at the top of interface. If you want to know the content of ingredients in Cimicifuga species, "Cimicifuga" was filled into the field as an example. The search results were shown in figure 6.1.

Figure 6. Interface after the fifth link at the frontpage was clicked.

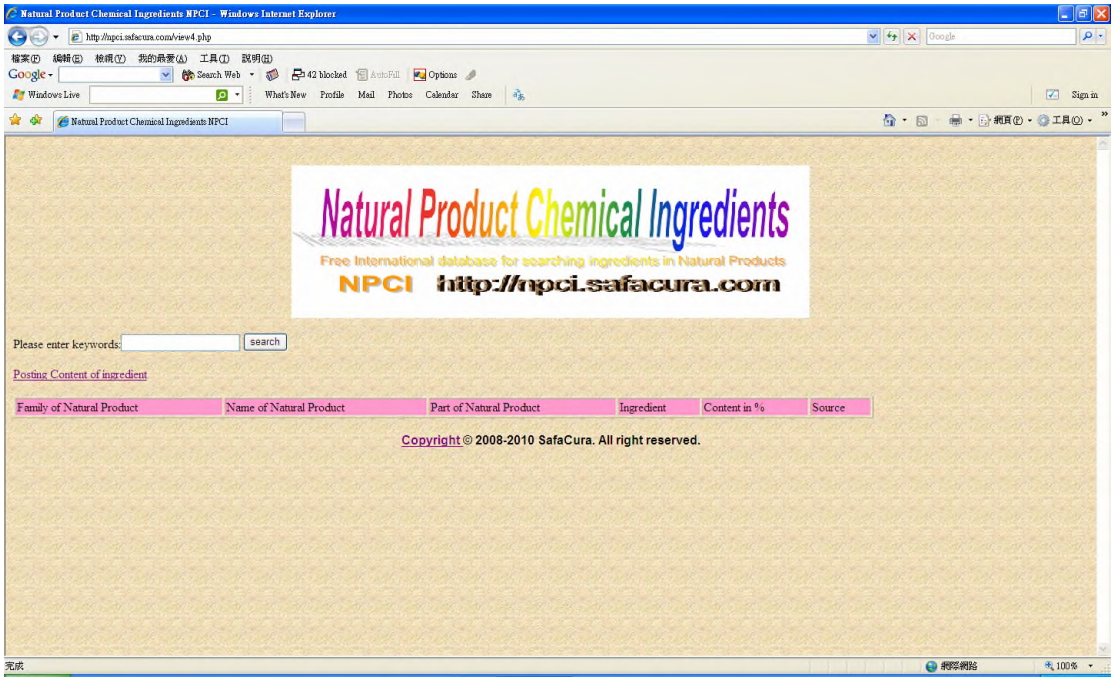
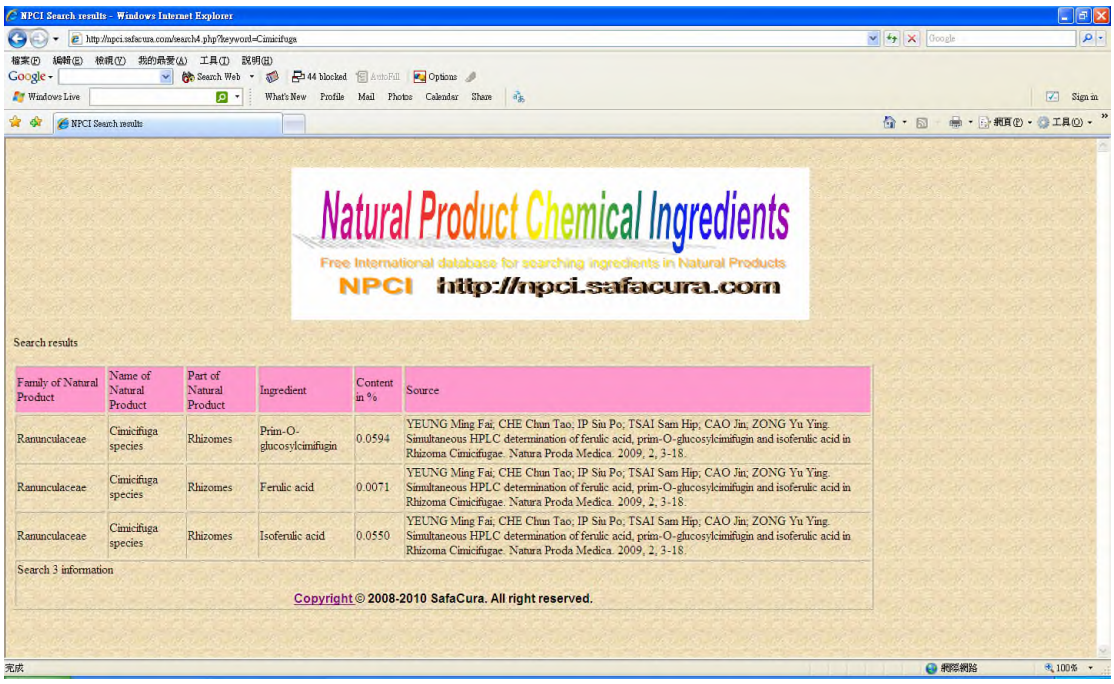


Figure 6.1 Interface shows the search results after filling the keywords with “Cimicifuga”



Click of sixth link: To find out content of specific ingredient in natural products

Figure 7 shows the interface after the sixth link at the frontpage was clicked. A field called “Please enter keywords” was shown at the top of interface. If you want to know the contents of oleanolic acid in natural products, “oleanolic acid” was filled into the field as an example. The search results were shown in figure 7.1.

Figure 7. Interface after the sixth link at the frontpage was clicked

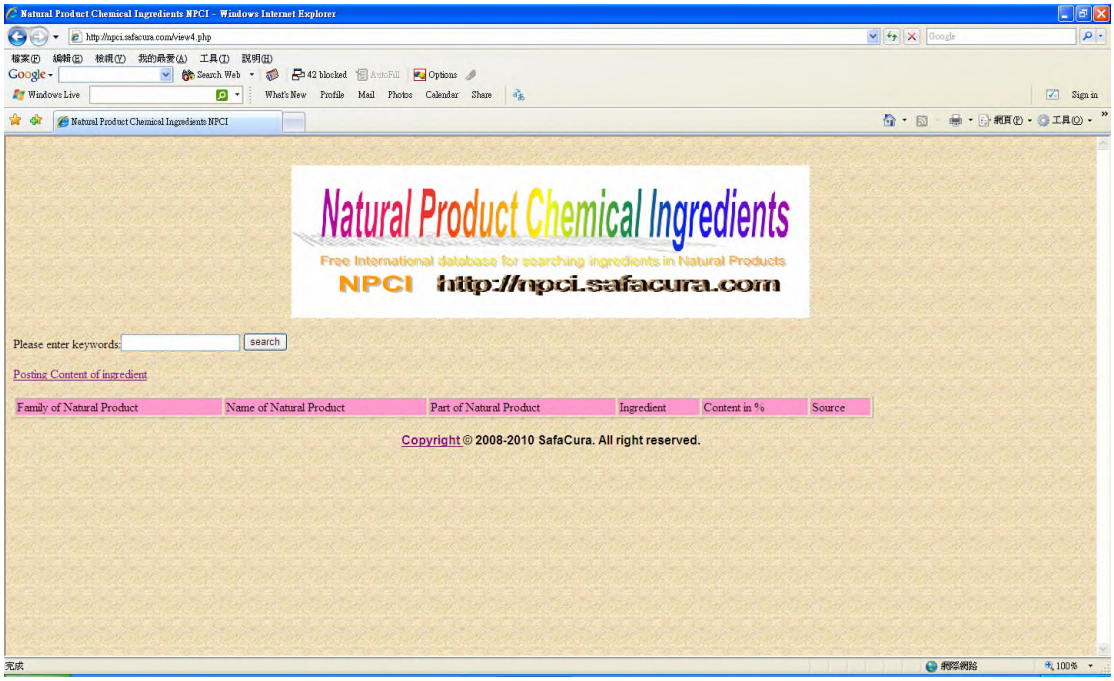
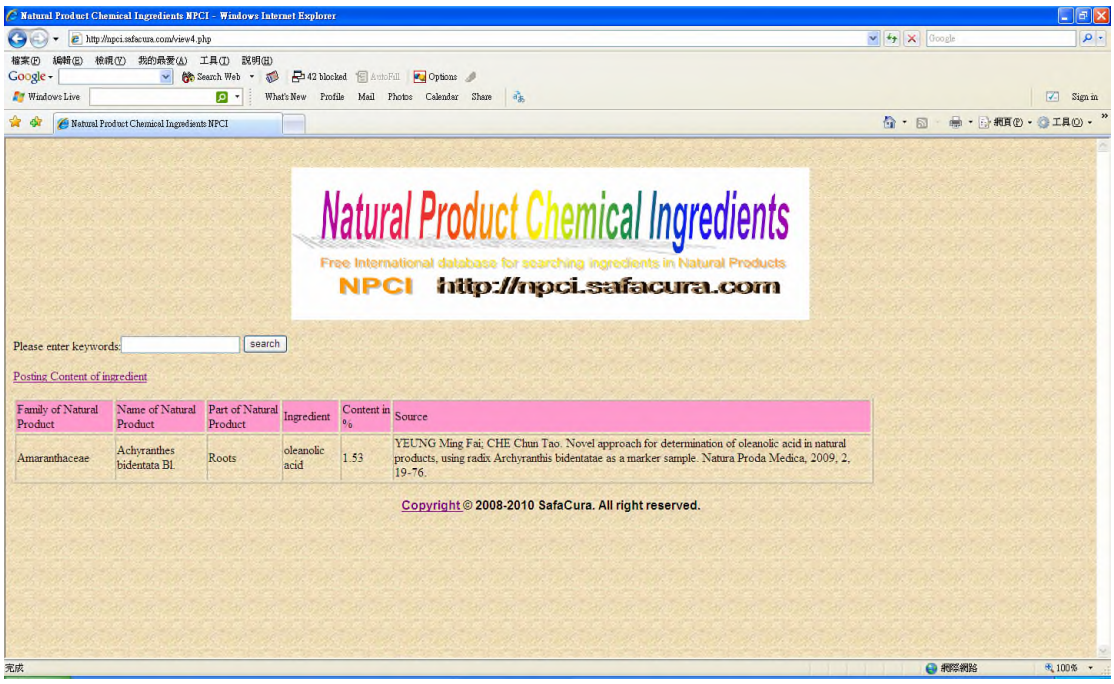


Figure 7.1 Interface showed search results after entered the keywords as "oleanolic acid"



Conclusion

An international database, "Natural Product Chemical Ingredients" (NPCI) was developed for collaborating data of ingredients in natural products. The website uniform resource locator (url) address is http://npci.selfip.org .