

## INDEX OF THE VECTORS OF VIRUS DISEASES OF PLANTS

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This index, like that of the host plants of virus diseases, presented far more difficulties than were anticipated by the compiler. This was due to two causes, vis., (1) The compiler did not have access to all the original records, (2) Some of the records were incomplete in that they gave the generic name only, or the common names only.

The original plan was to give the first record only but in some cases it has appeared desirable to give additional records. The names of insects given are, for the most part, those that were used by the authors but in some cases the synonyms (or most recent names) are given in parenthesis. As a result of following the the records of the authors, some genera appear under two names. The compiler has used the latin names of the hosts in some cases and the common names in others. This will be found to correspond in most cases with the original records or with the reviews and abstracts that have been consulted.

The compiler has several records that have been omitted because of incomplete data. If the readers of this index will send their corrections and additions to the writer, they will be used in a supplement.

The compiler wishes to express his thanks to the many workers who have read this manuscript and made suggestions and addition.

### ACERATOGALLIA SANGUINOLENTA

1927. Curly top of sugar beet from beet to beet. This insect was latter 1927 found to be *Agallia stricticollis*. Reported by Fawcett in Argentina. Fawcett stated that *Eutettix tenella* does not occur in Argentina.

### AGALLIA STRICTICOLLIS

1927. Curly top of sugar beet from *L. esculentum* to *L. esculentum*. Fawcett, Argentina.

### AGALLIA SANGUINOLENTA

1934. Yellow dwarf from Potato to potato. Black, N. Y.

## ALEYRODIDAE (undetermined)

1931. New virus disease, *N. tabacum* to *N. tabacum*, Storey, South Africa.
- 1932, Kroepoek, curl and crinkle, *N. tabacum* to *N. tabacum*, Thung, Dutch East Indies.
1932. Mosaic, *Manihot* to *Manihot*, Kufferath and Guésquiere, Africa.

## AMPHOROPHORA RUBI

1924. Red raspberry mosaic. Raspberry to raspberry, Bennett, Michigan. Wilcox & Smith, 1924. Bennett of Michigan (1932) reported that this species transmitted both yellow mosaic and red raspberry mosaic.
1930. Yellow mosaic, Raspberry to raspberry, Bennett, Michigan

## AMPHOROPHORA RUBICOLA

1927. Red raspberry mosaic, Raspberry to raspberry. Rankin, New York.

## AMPHOROPHORA SENSIORATA

1932. Red raspberry mosaic, Raspberry to raspberry, Bennett, Michigan.

## ANURAPHIS TULIPAE

1934. Breaking, tupils to tulips, McKenny Huges, England, Transmitted in bulbs in stores but not from growing plant to plant.

## APHIS sp.

1919. Leaf roll, net necrosis, spindlings tuber, mild mosaic, leaf rolling mosaic, severe mosaic, unmottled mosaic, potato to potato, Schultz, Folsom, Hildebrant & Hawkins, Maine.
1921. Mosaic, beets to beets, Robbins, Colorado.

## CUCUMBER APHID

1925. Mosaic, *Physalis pubescens* to *Physalis pubescens* and *C. sativus*, Walker, U. S.

## APHIS FABAE (-A. RUMICIS)

1927. Mosaic, sugar beet and spinach to same. Schaffnit, Germany & Böning, Germany.
1927. Mosaic, potato to potato, Elze, Holland.
1929. Mosaic, *Vicia faba* to *P. vulgaris*, *Anthyllis vulvararia*, *T. pratense*, *T. hybridum*, *T. repens*, *T. agrarium*, *Melilotus altissima*, sweet pea and lupins, Merkel, Germany.

1929. Mosaic, Lupins to peas, sweet peas and *V. fabae*, Merkel, Germany.
1919. Mosaic. *Phaseolus vulgaris* to *V. fabae* and *Lupins*, Germany.
1929. Leaf roll, *S. tuberosum* to *S. tuberosum*, Elze, Holland.
1930. Mosaic. Spinach to spinach. Volk, Germany.
1930. Mosaic, Sugar beet to *Chenopodium album*, *Amaranthus retroflexus* and *Sonchus arvensis*. Novinenko, Ukraine.

*APHIS FORBSEI* (-*MYZUS FRAGAEFOLII*)

1928. Dwarf, *Fragaria* sp. to *Fragaria* sp., Plakidas, U. S.

*APHIS GOSSYPII*

1916. Mosaic, *C. sativus* to *C. sativus*, Doolittle & Jagger, working independently, U. S.
1925. Mosaic, *Micrampelis lobata* to *C. sativus*. Doolittle and Walker, U. S.
1928. Mosaic, *Gladiolus* to *Gladiolus*, Dossdall, Minnesota.
1931. Mosaic, *Commelina nudiflora* to celery and cucumber, Doolittle, U. S.
1932. Dwarf, Onion to onion, Drake, Tate & Harris, Iowa.
1934. Stunt, Lily to lily, Pape, Germany.
1934. Mosaic, *C. nudiflora* to *Apium graveolens* and *P. logascae*, Doolittle & Wellman.
- 1934-1935. Celery virus 1, Celery and *C. nudiflora* to many host species, Wellman, Florida.

*APHIS LABURNI* (-*A LEGUMINOSAE*)

1925. Rosette, *Arachis hypogea* to *A. hypogea*, Storey & Bottomley. South Africa. "Kruiziekte" of Java (Rutgers 1913) may be same as rosette, bunching and bunting. Also reported by Brooks in Gambia.
1927. Mosaic, Lily to lily, Ogilvie, Bermuda.

*APHIS MAIDIS*

1920. Sugar cane mosaic. *Saccharum officinarum* to *S. officinarum*, Brandes, U. S.
1920. Corn mosaic, *Zea mays* to *Zea mays*.
1929. Corn mosaic, *Sorghum arundinaceum* to *S. arundinaceum*, Storey, South Africa.
1929. A virus disease of grasses that does not attack sugar cane (grasses to grasses), Storey, South Africa.



## APHIS RHAMNI

1927. Leaf roll potato to potato, Elze, Holland.  
 1927. Crinkle potato to potato, Elze, Holland.  
 1928. Mosaic *Trifolium repens* to potato, van der Meulen, Holland.

## APHIS RUBIPHILA

1922. Mosaic, Raspberry to raspberry, Dickson, Canada, Dickson stated that the insect was not determined but "it is highly probable that it was *Aphis rubiphila*." Rankin reported proof in 1923 but in 1931 stated that yellow mosaic was not transferred by *A. rubiphila*. Bennett (1932) said that the literature regarding *Aphis rubiphila* was contradictory and in a letter to the compiler (Nov. 20, 1934) states positively that this insect is not a vector of mosaic but that it is a vector of curl. Grainger and Angood (1931) of England reported positive results in transferring mosaic from wild raspberry (*Rubus idaeus*) to same.  
 1922. Yellow leaf curl and mosaic, red raspberry to red raspberry. Rankin, Hockey and McCurry, Canada. Rankin said later that this insect does not transmit mosaic.

## APHIS RUMICIS (-A. FABAE)

1918. Mosaic, or blight, Spinach to spinach, McClintock & Smith, Virginia.  
 1930. Deformed leaf, Beets & Spinach to beets & spinach, Böning, Germany.  
 1930. Deformed leaf, *Rumex obtusifolius* & *R. crispus* to *R. obtusifolius* & *R. crispus*, Böning, Germany.  
 1930. Mosaic, Beans to bean, Fajardo, Wisconsin.  
 1932. Yellow dwarf, Onion to onion, Drake, Harris & Tate, Iowa.

## APHIS SAMBUCCI

1930. Dwarf, *Sambucus nigra* to *S. nigra*, Blattny, Czechoslovakia.

## APHIS SPIRACEAE

1931. Witches' broom, *Holodiscus discolor* to *H. discolor*, Zeller, Oregon.

## ASTEROCHITON VAPORARIORUM

1927. Mosaic, potato to potato, K. M. Smith, England. Some evidence in greenhouse.

## BALCLUTHA MBILA (-CICADULINA MBILA)

1924. Streak of sugar cane. Sugar cane and corn to sugar cane and corn, Storey, S. Africa.

## BEMISIA GOSSYPIPERDA

1931. Leaf curl. Cotton to cotton, Kirkpatrick, Sudan, Leaf curl and crinkle are the same.
1932. Leaf curl, *N. tabacum* to *N. tabacum*. Storey, South Africa. Disease is probably same as "kroepoek". Also occurs on *Zinnia elegans*. Vector discovered by Storey of South Africa and Thung at Klaten at about same time.

## BEMISIA MOSAICIVECTI

1932. Mosaic, Cassava to cassava. Ghésquiere, Belgian Congo.

## BREVIOCORYNE BRASSICAE

1930. Mosaic, Crucifers to crucifers, Clayton, New York.

## CALOCORIS BIPUNCTATUS

1923. Leaf roll, potato to potato, Murphy, Ireland.

## CALOCORIS FULVOMACULATUS

1928. Squirt mosaic, Hops to hops, Blattny, Czechoslovakia.

## CAPITOPHORUS FRAGARIAE

1934. Stunt, *Fragaria* sp. to *Fragaria* sp. Chamberlain, New Zealand.

## CAPITOPHORUS TETRARHODUS

1927. Dwarf. Blackberry to blackberry, Zeller, Oregon.

## CERATONIA TRIFURCATA

1924. Mosaic. Cowpea to cowpea, E. C. Smith, California.

## CHLORITA FLAVESCENS

- 1930, Virus disease. Hops to hops, Blattny. In Czechoslovakia (similar to nettle head in England).
1930. "Krausel," Hops to hops, Blattny, Czechoslovakia.

## CICADULA SEXNOTATA (-CICADULINA SEXNOTATA)

1928. Aster yellows. Aster and celery to aster and celery, Kunkel in New York.
1928. Aster yellows, Asters to parsnip and parsley, Kunkel, New York.
1928. Mosaic, Sugar beet to sugar beet, Novinenko, Ukraine.
1930. Aster yellows, Carrot & spinach to carrot & Spinach, Kunkel, New York.

1931. Aster yellows. From *Asters* to *Humulus japonicus*, *Monolepis chenopodioides*, *Abornia umbellata* (var. *grandiflora*), *Tetragonia expansa*, *Dianthus alpinus* *Herniaria glabra*, *Lychnis coronaria*, *L. viscaria*, *Polycarpon tetraphyllum*, *Tunica saxifraga*, *Vaccaria segitalis*, *Adonis aestivalis*, *Papaver nudicaule*, *Cheiranthus*, *allionii*, *Malcomia maritima*, *Radicula sylvestris*, *Potentilla monspeliensis*, *Limnanthes douglasii*, *Datisca cannabina*, *Helianthemum chamaeiistus*, *Blumenbachia hieronymi*, *Cajophora lateritia*, *Clarkia*, *elegans*, *Ammi majus*, *Daucus carota*, *Didiscus pusillus*, *Levisticum paludifolium*, *Pastinaca sativa*, *Armeria alpina*, *Limonium*, *suworowi*, *Anagallis linifolia*, *Vinca rosea*, *Gilia densiflora*, *G. tricolor*, *Polemonium coeruleum*, *Phacelia campanularia*, *P. congesta*, *P. viscida*, *P. whitlavia*, *Anchusa barrelieri*, *A. capensis*, *Dracocephalum ruyschiana*, *Physostegia virginica*, *Browallia demissa*, *Hyoscyanus niger*, *Nicotiana rustica*, *Petunia hybrida*, *Alonsoa warscewiczii*, *Collinsia bicolor*, *Linearia cymbalaria*, *L. maroccana*, *Maurandia scandens*, *M. lophospermum*, *Verbascum hybridum*, *Veronica peregrina*, *Didymocarpus hosfieldii*, *Thunbergia alata*, *Plantago alpina*, *P. fuscescens*, *P. psyllium*, *Centranthus calcitrapa*, *Lobelia erinus* (var. *compacta*) *Acroclinium roseum*, *Anthemis tinctoria*, *Arclotis grandis*, *Cacalia hastata*, *Carthamus tinctorius*, *Chariesis heterophylla*, *Chrysanthemum cineranifolium*, *Cineraria hybrida*, *Cirsium oleraceum*, *Chadanthus arabiscus*, *Coreopsis lanceolata*, *Cosmos bipinnatus*, *Cousiana hystrix*, *Echinops dahuricus*, *Emilia flammea*, *Erigeron glabellus*, *E. linifolius*, *E. speciosus*, *Ethulia conyzoides*, *Eupatorium urticaefolium* *E. perfoliatum*, *Felicia aethiopica*, var. *glandulosa*, *F. amelloides*, *Filago germanica*, *Flaveria repanda*, *Galinsoga parviflora*, *Grindelia squarrosa*, *Hedypnois cretica*, *Helenium autumnale*, *H. biglovii*, *H. hoopesii*, *H. nudiflorum*, *Heliopsis nudiflorum*, *H. laevis*, *Helipterum manglesii*, *Hieracium alpinum*, *Koelpinia linearis*, *Logascaea mollis*, *Leontodon autumnalis*, *Leontopodium alpinum*, *Leptosyne stillmani*, *Lindheimeria texana*, *Lonas inodora*, *Mulgedium alpinum*, *Parthenium integrifolium*, *Petasites albus*, *Rudbeckia hirta*, *Sanvitalia procumbens*, *Schukuhria abretanoides*, *Scolymus hispanicus*, *Spilanthes acmella*, *Thelesperma hybridum*, *Tolpis barbata*, *Tragopogon fluccosus*, *Tridax tribolata*, *Ursinia anthemiodes*, *Zacyntha verrucosa*, *Zinnia multiflora*. By Kunkel, New York.



1932. California celery yellows. Celery to celery, Kunkel, New York. This vector could not transmit the New York yellows to celery.

1932. Yellow dwarf. Onion to onion, Drake, Tate & Harris, Iowa.

CICADULA MBILA. (BALCLUTHA MBILA)

1925. Streak. Sugar cane to sugar cane, Storey, South Africa.

1930. Streak. Sugar cane to *Eleusine indica*, *Zea mays*, *Digitaria horizontalis*, Storey & McClean, South Africa.

DACTYLOPINUS sp.

1925. Mosaic. Cucumber, *Micrampelis lobata* to cucumber. Doolittle & Walker, U. S.

DIABROTICA DUODECIMPUNCTATA

1925. Mosaic. Cucumber, *Micrampelis lobata* to cucumber. Doolittle & Walker, U. S.

DIABROTICA VITTATA

1925. Mosaic. Cucumber to cucumber, Doolittle & Walker, U. S.

DISCONYCHA TRIANGULARIS

1930. Spindling tuber, potato to potato, Goss, Nebraska.

EMPOASCA sp.

1930. Mosaic. Bean to bean, R. C. Smith and Barker, Haiti. It has not been definitely proven that this disease is due to a virus.

EMPOASCA DEVASTANS

1930. Leaf crinkle. Cotton to cotton, Afzal reported this insect as a cause of the disease in Sudan.

EMPOASCA FABAE

1931. Leaf roll, potato to potato, Cleveland, Indiana.

EMPOASCA (CHLORITA) FLAVESCENS

1928. Mosaic. Sugar beet to sugar beet, Novinenko, Ukraine.

EPITRIX CUCUMERIS

1930. Spindling tuber, potato to potato, Goss, Nebraska.

1930. Unmottled curly dwarf, potato to potato, Goss, Nebraska.

1931. Leaf roll, potato to potato, Cleveland, Indiana. (To a limited extent.)

ERIOPHYES RIBIS

1924. Reversion, etc., *Ribes* to *Ribes*, Massee, England.

EUPTERY AURATUS

1927. Mosaic, potato to potato, K. M. Smith, England. (Some evidence.)

EUPTERIX AURATUS

1926. False blossom, Cranberry to cranberry, Dobrotsky, U. S.

1928. Mosaic, Sugar beet to sugar beet, Novinenko, Ukraine.

EUTETTIX TENELLUS

1905. Curly top of sugar beet sugar beet to sugar beet. Ball was the first to call relationship of this disease and this insect but at that time the disease was not known to be due to a virus.

1925. Curly top of sugar beet, *Phaseolus vulgaris* to *P. vulgaris*, Carsner, Calif.

1927. Curly top of sugar beet to tomato.

1927. Curly top of sugar beet to squash, McKay & Dykstra, Oregon, Washington and Idaho.

FRANKLINIELLA sp.

An obscure and destructive virus disease of tobacco in South Africa was reported by E. S. Moore (1932) to be transmitted by *Frankliniella* sp. Distinctive disease of *Datura stramonium*, two species of *Physalis* and *Nicandra physaloides* are transmitted by same insect.

1933. Virus disease, tobacco to tobacco, Moore, South Africa. This disease may be the same as spotted wilt of tomato.

FRANKLINIELLA INSULARIS

1930. Spotted wilt of tomato, tomato to tomato. Samuel, Bald & Pittman. Australia.

ILLINOIA. (MACROSIPHUM) PISI

1934. Mosaic, *Lucerne alfalfa* to *L. alfalfa*, Weimer, California.

ILLINOIA SOLANIFOLII (-MACROSIPHUM GEI)

1928. Breaking, Tulips to tulips, McKay, Brierley & Dykstra, U. S.

1932. Leaf rolling mosaic, potato to potato, McKay & Dykstra, Oregon.

1932. Leaf roll, potato to potato, McKay & Dykstra, Oregon.

1933. Mosaic, Bulbous Iris to bulbous Iris, Brierley & McWhorter, U. S.



## LEPTINOTARSE DECEMLINEATA

1930. Spindling tuber, Potato to potato, Goss, Nebraska.  
 1930. Unmottled curly dwarf, Potato to potato, Goss, Nebraska.

## LINCUS sp.

1934. Phloem necrosis, coffee to coffee, Stahel, Suriname.  
 (Transmission suspected).

## LYGUS PRATENSIS

1930. Spindling tuber. Potato to potato, Goss, Nebraska.  
 1930. Unmottled curly dwarf, Potato to potato, Goss, Nebraska.

## MACROPIS TRIMACULATA

1932. Peach yellows, Peach to peach. Kunkel, New Jersey,  
 Manns of Delaware has given additional evidence on this  
 subject.

## MACROSIPHUM sp.

1927. Mosaic, beets and spinach to beets and spinach, Schaffnit,  
 Germany, Böning, Germany.  
 1928. Mosaic. Potato to beets, van der Meulen, Holland.

## MACROSIPHUM GEI. (-M. SOLANIFOLII)

1927. Mosaic, Potato to potato, K. M. Smith, England.  
 1930. Breaking, tulips to tulips, McKenny Hughes (less impor-  
 tant than *Myzus persicae*). England.  
 1930. Red streak break, McKenny Hughes, England.  
 1931. Leaf roll, Potato to potato, Whitêhead, England.  
 1932. Yellow dwarf, Onion to onion, Drake, Tate & Harris,  
 Iowa.  
 1934. Self breaking, tulips to tulips, McKenny Hughes,  
 England.  
 1935. Virus disease, *Primula obconia* to *Datura stramonium*,  
 K. M. Smith, England.

## MACROSIPHUM PISL.

1929. Mosaic, *Trifolium pratense* to *P. vulgaris* & peas. Sweet  
 peas to *P. vulgaris* & Lupins. Peas to *P. vulgaris*, sweet pea,  
*T. pratense* & Lupins, *Vicia faba* to *P. vulgaris*, sweet pea,  
*Anthyllis vulneraria*, *T. pratense*, *T. hybridum*, *T. Agrarium*,  
*Melilotus altissima* & Lupins, Sweet pea to peas & *T. pratense*,  
*T. pratense*, Peas to *V. faba*. Lupins to sweet pea & *V. faba*.  
 Merkel, Germany.  
 1930. Mosaic of cucumber (Spinach blight). Spinach & cu-  
 cumber to Spinach y cucumber. Hoggan, Wisconsin.

1930. Mosaic. Spinach to Spinach, Volk, Germany.

1935. Mosaic, Pea to broad bean, garden pea, sweet pea and Canadian field pea. Osborn, New Jersey.

MACROSIPHUM SOLANIFOLII (-M. GEI)

1918. Blight or mosaic, Spinach to spinach, McClintock & Smith, Virginia.

1919. Mosaic, Potato to potato, Schultz, Folsom, Hildebrant & Hawkins, Maine.

1922. Mosaic bean to bean, Nelson in Michigan and Fajardo in Wisconsin working separately.

1923. Mild mosaic, alone and in combination with leaf roll and spindling tuber. Potato to potato. Schultz & Folsom, Maine.

1930. Cucumber mosaic, Tobacco to *Spinacia oleoracea*, Hoggan Wisconsin.

1930. Cucumber mosaic, Tobacco to tobacco and other *Solanaceae*, Hoggan, Wisconsin.

1933. Rugose mosaic. Potato to potato, Koch, Wisconsin.

1934. Tobacco mosaic, Tobacco to many *Solanaceous* plants, Hoggan, Wisconsin.

1933. Cucumber mosaic, Cucumber to Spinach and tobacco,

MELANOPLUS sp.

1928. Spindling tuber, Potato to potato, Goss, Nebraska.

1928. Unmottled curly dwarf, potato to potato, Goss, Nebraska.

MOONIA ABIMACULATA

1933. Spike disease, *Santalum album* to *S. album*.

MYZUS CIRCUMFLEXUS

1931. Cucumber mosaic. From tobacco and tomato, Hoggan, Wisconsin.

1931. Leaf roll. Potato to potato, Whitehead, England.

1932. Crinkle mosaic, Potato to potato, McKay & Dykstra, U. S.

1933. Virus A. Potato to potato, Loughnane, Ireland.

MYZUS FRAGAEFOLII

1927. Witches' broom, strawberry to strawberry, Zeller, Oregon.

1927. Xanthosis or yellow, strawberry to strawberry, Plakides, California.

MYZUS PELARGONII

1928. Breaking, Tulips to tulips, McKay, Brierley & Dykstra, U. S.

1932. Leaf rolling mosaic, Potato to potato, McKay & Dykstra, U. S.  
 1932. Leaf roll, Potato to potato, McKay & Dykstra, U. S.

## MYZUS PERSICAE

1917. Mosaic, Tobacco to tobacco, Allard, D. C.  
 1918. Mosaic, Lettuce to lettuce, Jagger, U. S.  
 1919. Mosaic, Potato to potato, Schultz, Folsom, Hildebrant & Hawkins, Maine.  
 1921. Mosaic, Chinese mustard and turnip to Chinese mustard and turnips, Schultz, Maine.  
 1921. Mosaic, Beets to beets, Robbins, Colorado.  
 1923. Leaf roll, Potato to potato, Murphy, Ireland.  
 1927. Mosaic. Potato to potato, K. M. Smith, England.  
 1927. Crinkle, potato to potato, Elze, Holland.  
 1928. Mosaic, beet to beet, van der Meulen, Holland.  
 1928. Mosaic. Potato to *Trifolium repens*, van der Meulen, Holland.  
 1928. Breaking, Tulips to tulips, McKay, Brierley & Dykstra, Oregon.  
 1929. Cucumber mosaic, Tobacco to susceptible *Solanaceae*, Hoggan, Wisconsin.  
 1929. Internal parenchyma mosaic. Potato to potato, Quanjer, Thung & Elze, Holland.  
 1929. Potato mosaic. Potato to tobacco, K. M. Smith, England. Produced symptoms which he believed to be the same as tobacco ring spot in United States.  
 1930. Mosaic, Bean to bean, Fajardo, Wisconsin.  
 1930. Mosaic, Spinach to spinach, Volk. Germany.  
 1930. Deformed leaf, Spinach to spinach, Böning, Germany.  
 1930. Deformed leaf, *Rumex obtusifolius* & *R. crispus* to *R. obtusifolius* & *R. crispus*, Böning, Germany.  
 1930. Cucumber mosaic. Tobacco to Spinach and spinach to spinach, Hoggan, Wisconsin.  
 1930. Fern leaf (Cucumber mosaic) tomato to tomato, Mogen-dorff.  
 1930. Red streak, Tulip to tulip, McKenny Hughes, England. On the variety, President.  
 1930. Red streak, Tulip to tulip, McKenny Hughes, England.  
 1930. Crinkle, Potato to potato, K. M. Smith, England. On the variety, President.  
 1930. Leaf roll, Potato to *Capsicum* sp. *Datura stramonium*, D.



*tatula*, *Lycopersicon esculentum*, *Solanum dulcamara*, *S. nigrum*. Dykstra, U. S.

1930. Pseudonetnecrosis, Potato to potato, Quanjer, Thung & Elze, Holland.
1931. Mosaic, Tomato to tomato, Cleveland, Indiana. Not first record.
1931. Tobacco mosaic, tobacco to many *Solanaceae*, Hoggan, Wisconsin.
1932. Yellow dwarf, Onion to onion. Drake, Tate & Harris, Iowa.
1932. Hy II, III and IV. *Hyoscyamus niger*. to *H. niger*. Halmilton, England, K. M. Smith says that these viruses are same as viruses X and Y.
1932. Rugose mosaic, Potato to potato, McKay & Dykstra, U. S.
1932. Leaf rolling mosaic, Potato to potato, McKay & Dykstra, U. S.
1933. Mosaic, Dahlia to dahlia, Brierley, New York.
1933. Virus A. Potato to potato, Loughnane, Ireland.
1933. Rugose mosaic. Potato to potato, Koch, Wisconsin.
1931. Breaking. Tulips to tulips. McKenny Hughes, England.
1933. Cucumber mosaic, cucumber to spinach. Hoggan, Wisconsin.
1933. Cucumber mosaic, Tobacco and Spinach to spinach., Hoggan, Wisconsin.
1934. Mosaic, Bulbous iris to bulbous iris, Brierley & McWhorter, U. S.
1934. Yellow dwarf, Potato to potato, Koch, Wisconsin.
1934. Self breaking, Tulips to tulips, McKenny Hughes, England.

#### MYZUS PSEUDOSOLANI

1925. Mosaic, Potato to potato, Murphy & McKay, Ireland.
1931. Cucumber mosaic, Tobacco to tomato, Hoggan, Wisconsin.
1934. Tobacco mosaic, Tobacco to many *Solanaceae*., Hoggan, Wisconsin.
1934. Narrow leaf, Tomato to tomato, Chamberlain, New Zealand.

#### NEPHOTETTIX APICALIS var. CINCTICEPS

Dwarf, Rice to rice. This is the first record of transmission of a virus disease by an insect, and was made by Takata. It was at first supposed that the insects were the cause of the disease

but later studies by Takami (Journ. Jap. Agri. Soc. No. 241: 22-30, 1901, (in Japanese) reported that it was a carrier.

ORTHEZIA INSIGNIA

1932. Virus disease, *Ephiphyllum truncata* to *E. truncata*. Blattny & Vukulov, Czechoslovakia.

ORTHEZIA UTRICAE

1924. Mosaic. *Clerodendron fragans* to *C. fragans*. Blattny, Czechoslovakia.

ORTHOTYLUS FLAOSPARUS

1928. Virus disease, Sugar beet to sugar beet, Novinenko, Ukraine.

PENTALONIA NIGRONERVOSA

1925. Bunchy top, Banana to banana, Goddard, Australia.

1926. Bunchy top, Manila hemp (*Musa textilis*) to Manila hemp. Ocfemia, Philippine, Islands.

1930. New virus disease, banana to banana, Magee, Australia.

PEREGRINUS MAIDIS

1922. Mosaic, Corn to corn. Kunkel, Hawaii. This mosaic is different from sugar cane mosaic. This insect does not transmit sugar cane mosaic. May be same disease as corn stripe of Stahl.

1927. Corn stripe, Corn to corn, Stahl, Cuba.

PERKINSIELLA SACCHARICIDA

1933. Fiji disease, Sugar cane to sugar cane. Mungomery & Bell, Australia.

PERKINSIELLA VASTATRIX

1933. Fiji disease, Sugar cane, to sugar cane. Ocfemia, Hurtado & Hernández, Philippine Island.

PIESMA (ZOSMENUS) QUADRATA

1928. Leaf curl, Beets to beets, Böning, Germany.

POECILOSCYTUS COGNATUS

1928. Mosaic, Sugar beet to sugar beet. Novinenko, Ukraine.

PROTOPARCE SEXTA

1925. Mosaic, Tobacco to tobacco, Elmer, Iowa.

PSEUDOCOCCUS CITRI

1928. Mosaic, Tobacco and tomato to tobacco and tomato, Olitsky, U. S.

PSEUDOCOCCUS MARITIMA

1925. Mosaic, Many hosts to many hosts. Elmer, Iowa.

RHOPALOSIPHUM (MYZUS) PERSICAE

1918. Blight. Spinach to spinach, McClintock, Virginia.

RHOPALOSIPHUM PRUNIFOLIA

1932. Yellow dwarf. Onion to onion. Drake, Tate & Harris, Iowa.

RHOPALOSIPHUM RUBI

1927. Virus disease, Raspberry to raspberry, Blattny, Czechoslovakia.

SYSTEMA ELONGATA

1930. Spindling tuber, Potato to potato, Goss, Nebraska.

1930. Unmottled dwarf, Potato to potato, Goss, Nebraska.

TETRANYCHUS TELARIUS

1931. Leaf roll, tomato to tomato to some extent. Cleveland, Indiana.

THRIPS MINUTA var. PTEMANSI

1926. Mosaic, Sugar cane to sugar cane. Costa Lima, Brazil.

THRIPS TABACI

1927. Spotted wilt of tomato. Tomato to tomato, Pittman, Australia. K. M. Smith (1932) transmitted this disease by this insect to many hosts in England, Gardner & Whipple (1934 and 1935), transmitted the disease by this insect to many hosts in California.

1931. Yellow spot, Pineapple to pineapple. Lindford, Hawaii

1931. Streak and necrosis. (Same as pineapple yellow spot).

*Pisum sativus* to *Emilia flammea* (-*E. sagittata*). Linford, Hawaii.

1931. Leaf roll, Potato to potato to a limited degree. Cleveland, Indiana.

1932. Spotted wilt of tomato, Tobacco to tomato and the reverse, K. M. Smith, England.

1932. Spotted wilt of tomato, *Datura stramonium* to tomato and the reverse. K. M. Smith, England.

ZYGINA PALLIDIFRONS

1927. Mosaic, Potato to potato, K. M. Smith, England.