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Fusarium Oxysporum on Rosa Species in Eastern Zone of Nepal and North Bihar, India

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ABSTRACT

9 potted plants of *Rosa sp.*, in which 3 *R. indica* L. and others hybrid *Rosa sp.* 10 & 2 years old respectively werye observed the sequence of formation of dried or dead stems and alive stems. New branches and bud formed after cutting on date 6/11/2020 and the observation on date 27/11/2020 i.e. within 21 days. *Fusarium oxysporum* causing the wilting or dried condition in *Rosa sp.* was confirmed in the Laboratory of Department of Botany, M.M.A.M. CAMPUS, BIRATNAGAR, T.U, U NEPAL on Date 22/11/2020 at 1-2.15 P.M as characterised by Synder & Hansen (1940, 1941,1945)[27,28,29] Synder (1965)[30], Dube (1983)[3] & Mehrotra (1980)[11].

1. Introduction

Rosa indica L.is well known ornamental plant. Its petal is useful to get rose water, essential oil, gulkund & perfume. Several hybrid varieties are preferred in garden. Worship purposes at home or temple is also common practice and usual manner to gift any one, whom loves or affection or even regard as noticed. It has good economic importance in our lives. It belongs to the family Rosaceae. Stem is woody, solid, green, aerial, erect, branched and prickly (spines), While the leaf is compound, petiolate and adnate stipule. Leaflets present in no. 3-5 even sometimes more, opposite, ovate, dentate, acute, unicostate reticulate venation. Solitary, axillary a clusters of Inflorescence is seen. Flowers are bracteate [sometimes(-)], pedicillate, complete, hermaphrodite, actinomorphic, perigyrous, large, Scented, Variously coloured & thalmus is cup-shaped. Calyx-sepals 5, gamo sepalous, lanceolate, deutate, hairy and green in colour, corolla Petals 5 or indefinite, polypetalous, rosaceous, imbricate & each petal is ovate type, Various colour, showy and fragrant. Androccium many i.e. polyandrous, inserted on the edge of the disc, unequal, dithecous, basifixed & introse. Gynoecium - poly carpellary, apocarpous, semi-inferior, ovule one in each carpel, basal placentation, style Lateral, hairy, free, stigma terminal. Fruit - Staerio of achenes, enclosed by the succulent bright red calyx tube called hip. Seed - non edospermic Sharma (1989). *Rosa damascena* Mill., *R.centifolia L.* and *R. moschata* Mill. are the Source of flower-petals to get essential oil in perfumery kochhar (1998). According to him 100 gms of flowers yields 0.5gm oil (even sometime Less) i.e. 0.4 -0.5% oil is obtained by the distillation mechanism and becomes costly. The principal constituent of rose oil is phenylethyl alcohol (soluble in water) and other components are citronellol, geraniol and nerol. Rose oil is largely used in perfuming or scenting Soaps, Soft drinks and liquers. Rose water is used in eye lotions and eye washes. It is sprinkled on guests on ceremonial occasions. Dried petals in making cold drinks during Summer is used. The fruits (rose hips) are source of vitamin C.

2. Review of Literature

The characteristics of host plant *Rosa indica L.* was described by several taxonomists and the use described by Sharma (1989) and Kochhar (1998), while the details in wealth of India. The description of the pathogen *Fusarium oxysporums* was given by wollen weber & Reinking[32] in Berlin, while Synder & Hansen (1940, 1941 & 1945)[27,28,29] mentioned species concept of Fusarium with references and differences again Synder (1965)[30] gave the Current status of Taxonomy and its Perfect stage. Some basic textbooks by different authors Singh (1968 & 1980)[25,26] Mehrotra (1980)[11] Ingold (1971)[6] & Dube (1983)[3] have been giving the knowledge of *Fusarium sp.* Mishra (2008)[12] presented the paper at vishakhaptnam in ISCA-Conference. Mäshra (2012a, 2012b)[13,14] presented two papers at Banglore, participating Indian Phyto pathological Society, IIHR, Hissarghatta lake post. Devi (2010)[1], Dorjey (2017)[2], Dubey (2016)[4], Dubey et.al (2017)[5], kar et.al. (2016)[7], kaur et.al (2019)[8], khan et.al (2017)[9], Kotari et. al. (2018)[10], Mishra & Dhar (2010)[15], Mukhopadhyay et.al. (2017)[16], Murumkar (2010)[17], Mushrif & Khulbe (2010)[18], Nazia & Sharda (2017)[19], Ramappa & Gowri (2016)[20], Ray & Sharma (2010)[21] Ray et.al (2016)[22], Saharan (2010)[23], Singh et al (2010)[24] & wavare (2017)[31] have given different aspects, control, genetic behavior etc. about *F. oxysporum*. The phenomenon of wilting diseases in different host plants has been attracted by different mycologists at present.

3. Observation

i. 3 plants of Rosa, *indica L.*, having 10 years old and 6 plants of hybrid *Rosa sps.* (used to give different varieted colours like Pink, Deepred, yellow, white-red patches, mixed colour & white orange) having 2 years old were cut on Date 6/11/2020.

ii. Both dried & Living Stems were cut Mannure of dried Cow dung were poured on date 4/11/2020.

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No. of Obs.	Age of plants in years.	Dead branches. No.	Alive branches No.	Bud	Remarks
1	10	3	1	3	Main 1cm., Lateral 2 -3 cm each
2	10	1	6	8	Whorl of branching, 15cm dia. & 8 buds
3	10	21	4	2	Maximum dead branches
4	2	4	2		One 5 cm. & another 4 cm.
5	2	7	11	1	Maximum new branches of different length
6	2	10	6		3-6 cm.
7	2	5	3	1	1^{st} 30cm, 2^{nd}&3^{rd} – 5cm,
8	2	5	3		3cm, 5cm – 2
9	2	9	5		10cm – 18cm.

iii.The growth on living or alive stems were noted on Date 27/11/2020, which is given above in Table No. 1.

iii. The dried or dead branches are due to *Fusarium oxysporum* (var. rosae).

iv. Maximum No. of dead branches is 21 i.e. Maximum loss of stem in *R. indica L*.

4. Microscopic observation

Infected leaves and stems were Selected on Date 22/11/2020 at 1-2.15 P.M.

i. At - Laboratory of the Dept of Botany, M.M.A.M. Campus, Biratnagar, T.U., Nepal.

ii. Leaf - Mycelium (+).

- Micro-conidia in groups (+).
- colour slightly blackish at the base of leaflet (+)
- Accumulation of host cells with mycelia.

iii. Stem - Mycelium (+) in the vascular region i.e. in Xylem and phloem.

- also in cortex.
- Macroconidium is slightly curved & 4 segmented
- one segment, out of four is thick walled larger i.e. protesting unfavourable condition for germination i.e. chlamydospore

The identification was to be *Fusarimu oxysporum* var. *rosae* according synder Sander (1965)[30], Drube (1983)[3] & Mehrotra (1980)[11]. The nine species concept of Synder (1865)[30] was accepted by mycologists.

5. Climatic condition

There is specification of the host *Rosa indica L.* and the pathogen *Fusarium oxysporum*. The maximum temperature and the minimum temperature is 36°C & 8°C respectively from Sept. 2019 to oct. 2020 and favours the disease wilting in the host.

6. Conclusion

Maximum loss in plant due to dried branches, gives less productivity and artificially, cut in *Rosa indica*, Blocking due to deposition of mycelia, macrocoridia and Microconidia in stem & then to leaves is common reaching in xylem and phloem and other tissues of the both (stem & leaf) and nomenclature of the pathogen may be given as *Fusarium oxysporum* var. *rosae*,

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