PARTIAL RESISTANCE TO RICE BLAST DISEASE IN SOME COMMERCIAL RICE CULTIVARS UNDER EGYPTIAN CONDITIONS

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ABSTRACT

Ten commercial rice cultivars were evaluated to partial resistance for blast disease under greenhouse conditions at Rice Research and Training Center, Sakha, in 2000 season .Ten isolates of *Pyriculuria grisea* collected from different locations were tested and identified on the international differential rice varieties (IDV) and commercial rice cultivars. Five from the new cultivars i.e Giza 177, Giza 178, Sakha 101, Sakha 102, and Sakha 104 showed susceptible reactions to one or two of the tested isolates. Giza 159 and Giza 171 were susceptible to all tested isolates. The isolates placed in seven race-groups i.e. two isolates for each of group IA, IC and ID, whereas, one isolate conformed each of IB, IG, IH and II races. Two races I A-69 (Isolate No.5) as highly virulent and IG-1 (isolate No.52) as a less virulent on the IDV were selected to study partial resistace parameters. Total number of lesions / leaf or plants, sporulation density and lesions type that developed differed greatly among cultivars. The number of lesions decreased by increasing leaf age. High numbers of necrotic spots (type 1-2) on new rice cultivars than on old cultivars could be attributed to hypersensitivity phenomenon. The new rice cultivars had lower number of type 4 lesions and less number of spores / lesion (sporulation capacity) than the old cultivars. This is may reflect a level of partial resistance in addition to major gene effects on the new cultivars than the old ones.

INTRODUCTION

Rice blast disease caused by *pyricularia grisea* (Cooke) Saco. is a major disease of rice, Jeanguyot (1983). Up to the present, most breeders concentrate on the development of the highly resistant cultivars. A low infection type usually characterizes this resistance as an interaction between the pathogen race- specificity, and a simple inheritance. Unfortunately, in the most cases this type of resistance is broken soon after release of the cultivars (Ezuka, 1972; Jeanguyot, 1983, Ou, 1985 and Roumen, 1992). Resistance to infection of rice leaves by *P. grisea* was strongly depende on age and stage of leaf expansion. Resistance rapidly increased in more expanded (older) leaves, resulting in a reduced number of sporulating lesions per leaf area (Roumen *et al.,* 1992). Kamel *et al.* (1987) reported that number of lesions per leaf differed between the different cultivars and increased as leaf age decreased. In addition, sporulation capacity differed for the entries. Partial resistance has been defined as a reduced epidemic build-up in the field despite a susceptible infection type (Parlevliet and Van Ommeren, 1975). Partial resistance to rice blast appears to be predominantly race non- specific and in some cultivars, partial resistance has been shown to be durable (Ezuka, 1972 and Yeh and Bonman, 1986), thus breeding for higher levels of partial resistance may be the better alternative for developing blast resistant rice cultivars. It may be more efficient to evaluate components of partial resistance and select for one or more of the components. Among the components associated with higher levels of partial resistance a reduced infection frequency, a longer latent period, and a reduced sporulation capacity (Parlevliet, 1979). Yunoki *et al.* (1970) and Ezuka (1972) screened for the partial resistance in the greenhouse by single isolates with many virulence factors, since partial resistance in the temperate Japonica cultivars appeared to be largely race-non-specific. Also they reported that, the number of sporulating lesions which developed after inoculation was found to be important parameter. The high correlation between the number of sporulating lesions and number of leaves on the main culms developing such lesions regardless of isolate and despite large differences in a aggressiveness between the isolates, strongly supports earlier findings that a relatively high partial resistance in genotype is closely associated to a rapid increase of resistance with aging of the newly emerging leaves to high resistance leaves (Roumen, 1992 and Roumen *et al.,* 1992). Among 108 trials conducted in the International Rice Blast Nursery, Moroberekan showed qualitative resistance (0-3 scores) in 69% of the trails. It further showed the highest level of partial resistance among the six durable resistant cultivars tested (Ahn 1994). He objective of this study is to evaluate the level of partial resistance to blast disease in some new rice cultivars compared with the old susceptible cultivars.

MATERIALS AND METHODS

The tested commercial rice cultivars were seeded in plastic trays (30 x 20-x 15 cm), each tray comprised 18rows representing: 10 rice cultivars and eight international differential varieties. The trays were kept in the greenhouse at 25-30^{o} C, and fertilized with Urea 46.5% (5 g/tray).

Ten *Pyricularia grisea* isolates were used for inoculating the entries in the trays. Isolates were collected from rice plants grown in the previous season. The isolates were grown and multiplied on banana medium (200g. Banana, 10g. Dextrose and 20g. Agar) under florescent light for 10 days at 28^{0} C for spore production. The spores were harvested at a density of at least 25 spores / microscopic field, examined by 10 x objective. Rice seedlings of 20-day old, in the trays, were inoculated by spraying the water suspension of isolates. A spore suspension (100 ml.) of *P. grisea* was sprayed per 3 trays (representing one replication). The spray (5 x 10^{4} spores / ml) was practiced in the evening to avoid the retarding effect of light on both spore germination and germtube growth. The reaction of tested entries to blast infection was estimated according to IRRI scale (1996) seven- days after inoculation.

Two of the tested isolates were used as indicators for the partial resistance study. The first was isolate No. 5 (Race IA-69) as high virulent isolate as mentioned before. While, the second was isolate No. 52 (Race IG-1) as less virulent, using the same previous methods.

Measurement of partial resistance parameters :

A- Developmental type lesions:

Different type of lesions, resistant type lesions (1-2), moderately resistant type (3) and susceptible type lesion (4), were estimated started from 3, 5, and 7-days after inoculation.

B- Number of lesions /leaf and plant:

Ten seedlings from each entry and replication were examined for different type of lesion on different leaves of the plant i.e. second, third, and fourth leaf from the top. The mean number of each type lesion was calculated for each entry.

C- Sporulation capacity :

Number of spores for each entry was measured by cutting single leaves with type 4 lesion and incubated in test tube 9cm with1-ml distilled sterilized water for 24 hrs. The lesions were chalked very well to harvest the spores in the lesions. Number of spores per lesion was calculated by examining 5 microscopic fields (10 x) and the corresponding number by hymocytometer.

RESULTS AND DISCUSSION

Ten commercial rice cultivars were evaluated against 10 purified isolates of *Pyricularia grisea* under greenhouse conditions, data in Table (1) indicated that, 5 from the new cultivars i.e. Giza 177, Giza 178, Sakha 101, Sakha 102 and Sakha 104 showed susceptible reactions to one or two of the tested isolates. Giza 159 and Giza 171 were susceptible to all tested isolates. Giza 176 was susceptible to five isolates and moderately resistant to 2 isolates, however the old rice cultivars Reiho was susceptible to 3 isolates out of 6 isolates tested.

Eight international differential varieties were used to identify those isolates to races. Data in Table (2) showed that the isolates placed in seven race-groups ie. two isolates for each of group IA, IC and ID, whereas, one isolate conformed each of IB, IG, IH and II races. Bidaux (1976) and Notteghem (1981) observed that virulent strains existed for all the identified genes of vertical resistance and most of the strains possessed virulent genes, which were not necessary for their survival. Sehly *et al.* (1990) evaluated twenty seven rice entries under both field and greenhouse conditions, some entries showed complete resistance under both tests, other were resistant in one test but susceptible in the other. While Giza 171, Giza 172 and Giza 159 showed completely susceptible in greenhouse and field conditions. Races IC 31,I D, 3, I D 15, I G1, I H, and II were identified in the obtained isolates. Sehly *et al.* (2000) inoculated forty-five isolates of *P. grisea* inoculated on eight international differential varieties. The most common races were IH-1 (36. 6%), I D-race group (17.8%), I A (13.3%), I G-1 (13.3%) and a virulent race group II (9.0%).

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Two races I A-69 (Isolate No.5) as highly virulent race and I G-1 (isolate No.52) as a less virulent one were selected to study partial resistant parameters. Data presented in Table (3) for race IA-69 indicated that, the number of sproulating lesions (type 4)/ plant ranged from 0.03 to 6.9 lesions/plant. The greatest number of lesions was shown on Giza 171 (6.9) followed by Giza 176 and Giza 159, which had 3.5 and 3.2 lesions, respectively. Whereas, the lowest number of lesions was obtained from Sakha 101 cultivar as 0.03. The rest cultivars showed intermediate number of lesions ranged from 0. 07 to 1. 3 lesions / plant. On the other hand race I G-1 gave 5.2 lesions on Giza 171 rice cultivar followed by Giza 159 with 2.7, while the other eight cultivars ranged from 0 for Giza 178 and Sakha 103 to 0. 51 lesions / plants for Giza 177 This agree with Roumen *et al.* (1992) who reported that, total number of sporulating lesions that developed differed greatly among cultivars. The number of sporulating lesions on C039 was about eight-fold than that in IR 36 which had partial resistance. Roumen (1992) found that, large differences between genotypes were found for the number of sporulating lesions that developed, and this factor was closely related to the period that leaves remained susceptible after appearance. Sporulation capacity per lesions (number of spores) differed greatly for all cultivars in both of the two races as showen in Table (3) the greatest number of spores were obtained per lesion from Giza 176 followed by Giza 159, Giza 171 and Reiho with 52.5, 25, 20 and 18.75 thousand spores / lesion, respectively. While Sakha 101, Sakha 102 and Sakha 103 rice cultivars gave the less and same number of spores with 1.25 thousand spores / lesion under the high virulent race (IA-69) whereas race IG-1 on Giza 171 gave the highest number of spores / lesion followed by Giza 159, Reiho and Giza 176, while Giza 178, and Sakha 101 where completely resistant (zero spores).

Table (3): Number of lesions per plant and sporulation capacity on ten rice cultivars inoculated with two races of *Pyricularia grisea*

Cultivars	Race IA- 69		Race IG-1	
	No. of lesions / plant	No. of spores / lesions(1000)	No. of lesions/ plant	No. of spores / lesions(1000)
Giza 159	3.20	25.00	2.70	27.50
Giza 171	6.90	20.00	5.20	50.00
Reiho	0.80	18.75	0.13	16.25
Giza 176	3.50	52.50	0.20	13.75
Giza 177	1.30	13.75	0.51	1.25
Giza 178	0.14	2.50	0	0
Sakha 101	0.03	1.25	0.07	1.25
Sakha 102	0.13	1.25	0.34	1.25
Sakha 103	0.07	1.25	0	0
Sakha 104	0.20	2.50	0.06	1.25

These data are coincide with the findings of Kamel *et al.* (1987) who mentioned that, sporulation capacity per lesion differed greatly for all cultivars, Reiho and Giza 159 showed the highest sporulation capacity, while the line GZ- 1394-10-1-1 showed the less, GZ – 2175-5-6 and GZ -2175-5-4 also exhibited low sporulation capacity.

The youngest leaf (1st leaf) which emergence after inoculation was discarded. The obtained data were shown in Table (4). The number of lesions on the 2nd leaf was much more than that on the 3rd and 4th leaf. This is may be due to the increase of resistance by age. This agree with Roumen *et al.* (1992) who reported that the importance of leaf age as the best parameter to evaluate partial resistant and mentioned that, most lesions were found on the youngest leaf closet to the top, in all cultivars. At the same time, the proportional distribution of the lesions over the leaves varied between genotypes, nearly all lesions were located in the top leaf (ranged from 93-98%). The third leaf from the top was also completely resistant in IR50, but in this cultivars relatively more lesions developed in the second youngest leaf (mean of 12 %). Roumen (1992) mentioned that, the number of sporulating lesions per cm^2 leaf area was highest in very young leaves and declined with increasing leaf age.

Table (4): Number of $type_4$ lesions per leaf on ten rice cultivars inoculated with two races of *Pyricularia grisea*

Cultivar	Race IA- 69 No. of lesions / leaf				Race IG-1 No. of lesions / leaf			
	2nd leaf	3rd leaf	4th leaf	Total/ plant	2nd leaf	3rd leaf	4th leaf	Total/ plant
Giza 159	1. 93	1. 20	0. 07	3. 20	1. 43	1. 27	0	2. 7
Giza 171	4. 03	2. 50	0. 40	6. 93	2. 90	1. 97	0. 33	5. 2
Riho	0. 20	0. 40	0. 20	0. 80	0. 10	0. 03	0	0.13
Giza 176	3. 03	0. 47	0	3. 50	0. 10	0. 10	0	0. 2
Giza 177	1. 33	0. 0	0	1. 33	0. 17	0. 27	0. 07	0. 51
Giza 178	0. 07	0. 07	0	0. 14	0	0	0	0
Sakha 101	0. 03	0. 0	0	0. 03	0. 07	0	0	0. 07
Sakha 102	0. 10	0. 03	0	0. 13	0. 27	0. 07	0	0. 34
Sakha 103	0. 07	0. 0	0	0. 07	0	0	0	0
Sakha 104	0. 17	0. 03	0	0. 20	0	0. 03	0. 03	0. 06

Few lesions were found on the 4**th** leaf on the old commercial cultivars Giza 159, Giza 171 and Reiho with 0. 07, 0.40 and 0.20 lesions under I A-69 race. The fourth leaf on the rest of the tested cultivars exhibited completely resistance. The same trend was obtained on the cultivars, which inoculated, by IG-1 race except on fourth leaf of Giza 171, Giza 177 and Sakha 104 which exhibited a few lesions. The old commercial cultivars gave the greatest number of lesions compared with the others new ones. Roumen (1992) found the large differences between genotypes were due to the number of sporulating lesions that developed, and this factor was closely related to the period that leaves remained susceptible after appearance. Differences between genotypes were also found in lesion size, and lesion density.

The development of different types of lesions during (latent period), for *P. grisea* races is shown in Table (5). Three days after inoculation (DAI), necrotic spots differed within genotypes. Giza 171, Giza 178 and Sakha 104 were free from infection, while Reiho, Sakha 101 and Sakha 103 had one necrotic spot each. Giza 159 and Giza 176 had 3 necrotics each, but Giza

177 and Sakha 102 exhibited the highest of sensitivity (6 spots / 10 plants). The number of spots on the old commercial cultivars (Giza 159, Giza 171, Reiho and Giza 176) progressively increased from type (1-2) to types 3 & 4. Number of lesions on Giza 171 developed from 0 to 77 and 68 at 3, 5 and 7 days, respectively. The same trend was obtained with Giza 159 and Giza 176, whereas the number of necrotic spots decreased from 6 to 4 and 2 (type 3 and 4 lesions) on Giza 177 and from 6 to 5 and 1 on Sakha 102. Giza 178, Sakha 101 and Sakha 104 had more lesions of type3 than lesions of type 4. The same trend was obtained by IG-1 race, but the number of type4 lesion on the old cultivars was less compared with IA-69 race. However, on Reiho number of lesions developed from 2 (3-DAI) to 3 (5-DAI) and 11 type 4 (7-DAI). Sakha 103 proved to be completely resistant to both blast races. This is may indicate that, the lower numbers of susceptible type (4) lesions on new rice cultivars than that on the old cultivars could be attributed to some degree partial resistance. Rodriguez and Galvez (1975) reported that latent period ranged from 5to 9 days depending on the cultivar. However, examination of their results revealed that the isolates used by these authors appeared to be avirulent to most of the tested cultivars. The latent period increased when cultivars developed a more resistant infection type, but cultivar differences were not very clear when the isolate was virulent. Brodni *et al.* (1988) found five-day differences for latent period among seven rice cultivars, but no information on the infection type was supplied.

Table (5): Developmental and number of different types of lesions, 3, 5 and 7-days after inoculation on 10 rice cultivars with two races of *Pyricularia grisea*

Cultivars	**Race IA-69 No. of lesions / 10 plants**			**Race IG-1 No. of lesion / 10 plants**		
	3 days (1-2)	**5 days (3)**	**7 days (4)**	**3 days (1-2)**	**5 days (3)**	**7 days (4)**
Giza 159	3	23	32	9	12	24
Giza 171	0	77	68	8	37	52
Reiho	1	2	2	2	3	11
Giza 176	3	11	38	2	0	1
Giza 177	6	4	2	1	7	6
Giza 178	0	4	1	9	5	0. 3
Sakha 101	1	5	0. 3	0	0	0
Sakha 102	6	5	1	3	10	3
Sakha 103	1	0	0	0	0	0
Sakha 104	0	5	3	0	1	0. 6

REFERENCES

Ahn. S.W. (1994). International collaboration on breeding for resistance to rice blast, in Zeigler, R.S., leong S.A. and Teng. P.S. (Eds). Rice Blast Disease, C B A and IRRI, Walling ford. Oxon. VK. PP. 137-153.

Bidaux J.M. (1976). Screening for horizontal resistance to rice blast *Pyricularia oryzae* in Africa Academic Press, London, 159-172.

Brodni U.; J. Castano-Zapata and R.R. Nelson (1988). Evaluation of rate limiting resistance to blast disease in rice cultivars using sub-lethal concentrations of systemic fungicide. J. Phytopathology, 122:174-180.

Ezuka, A. (1972). Field resistance of rice varieties to blast disease. Rev. Plant Prot. Res., 5: 1-21.

IRRI (1996). Standard evaluation system for rice. 3rd ed. International Rice Research Institute, Los Banos, Philippines.

Jeanguyot, M. (1983). Lutte control la *pyriculariose* du riz Memoirs et Travaux de LIRAT 2 IRAT, Nogent- Sur Marne, France 55 PP.

Kamel S.M.; Balal M.S. Thoraya A. EL- Bigawi and Z.H. Osman (1987). Evaluation of Partial Resistance, to blast in some rice cultivars under Egyptian conditions. Proc. 5th Congr. Egypt. Phytopathol. Soc., Giza, 373-386.

Notteghem J.L. (1981). Analyse resultats dinoculation de 67 varieties de riz par 15 souches de *Pyricularia oryzae*. In Proceeding of the symposium on rice resistance to blast, IRAT, Montpellier, pp:301-318.

Ou, S. H. (1985). Rice Diseases. 2nd Edition. Commonwealth Mycological Institute. Kew, Surrey, England 380 PP.

Parlevliet J. E. and A. Van Ommeren (1975). Partial resistance of barley to leaf rust, *Puccini hordii*. II. Relationship between field trails, micro- plot tests and latent period Euphytica, 24: 293-303.

Parlevliet, J. E. (1979). Components of resistance that reduce the rate of epidemic development. Ann. Rev. Phytopalhol., 17: 203-222.

Rodriguez M. and G.E. Galvez (1975). Indications of partial resistance of rice to the fungus *Pyricularia oryzae* Cav. In G.E. Galvez (Ed), Proceedings of the seminar on horizontal resistance of the blast disease of rice. Series CE-No.9, pp137-154.CIAT,Cali, Colombia.

Roumen E. C. (1992). Effect of leaf age on components of partial resistance in rice to leaf blast. Euphytica, 63: 271-279.

Roumen, E.C.; J.M. Bonman and J.E. Parlevliet (1992). Led age related partial resistance to *Pyricularia oryzae* in tropical low land rice cultivars as measured by the number of sporulating lesions. Phytopathology, 82: 1414-1417.

Sehly M.R.; Z.H. Osman; H.A. Mohamed and A.O. Bastawisi (1990). Reaction of some rice entries to *Pyricularia oryzae* Cav. and rice picture in 1988. The Six Congress of Phytopathology, Cairo, 159-170.

Sehly. M. R.; Z. H. Osman; E. A. Salem; E. A. S. Badr and S. M. El- Wahsh (2000). Proceeding of the fourth. Trational Rice Research and Development Program Workshop 12-13 Feb., 2000: 73-115.

Yeh, W. H. and J. M. Bonmon (1986). Assessment of partial resistance to *pyricularia oryzae* in six rice cultivars. Plant Pathology, 35: 319-323.

Yunoki T.; A. Ezuka; Y. Sakurai; H. Shinoda and K. Toriyana (1970). Studies on the varietal resistance to rice blast. 3- Testing methods for field resistance on young seedlings grown in greenhouse. Bull. Chugoku Agr. Exp. Str. Japan. Series, E6: 1-21

المقاومة الجزئية لمرض اللفحة فى الأرز لبعض الأصناف التجارية تحت الظروف المصرية

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تم تقييم المقاومة الجزئية لمرض اللفحة على عشرة أصناف أرز تجارية تحت الظروف المصرية بمركز البحوث والتدريب فى الأرز بسخا موسم ٢٠٠٠. أستخدم فى الاختبار عشرة عزلات مختلفة لفطر *P. grisea* تم تجميعها من مواقع مختلفة خلال موسم زراعة الأرز حيث تم تعريف السلالات الفسيولوجية لهذه العزلات على مجموعة أصناف الأرز العالمية (International differential varieties) واختبارها على الأصناف التجارية.

وقد أظهرت النتائج أن:

خمسة من الأصناف التجارية الحديثة وهى جيزة ١٧٧، جيزة ١٧٨، سخا ١٠١ وسخا ١٠٣ وسخا ١٠٤ أصيبت بواحدة أو أكثر من العزلات بينما الصنف جيزة ١٥٩ وجيزة ١٧١ أصيبا بكل العزلات التى تم إختبارها. إتضح أن هذه العزلات تقع تحت سبعة من السلالات الفسيولوجية , عزلتين تقع تحت كل من مجموعة الـ ID, IC, IA وعزلة واحدة تقع لكل من مجموعة الـ II, IH, IG, IB . تم إختيار السلالتين IA-69 (العزلة رقم ٥) شديدة القدرة المرضية وIG-1 (عزلة رقم ٥٢) التى لها القدرة المرضية الأقل علي الأصناف المفرقة العالمية لدراسة المقاومة الجزئية.

كما وجد أن هناك انخفاض في عدد البقع النموذجية (طراز ٤) علي الأوراق المسنة عن الأوراق الأقل في العمر ، كما أن هناك انخفاض كبير جدا في عدد هذه البقع علي الأصناف الحديثة والمقاومة للإصابة عن الأصناف القديمة وكذلك قدرة هذه البقع علي إنتاج الجراثيم كانت عالية جدا علي الأصناف القديمة مقارنة بعدد الجراثيم علي البقع المتكونة علي الأصناف الحديثة وهذا يوضح أن الأصناف الجديدة لها القدرة علي المقاومة الجزئية وكذلك المقاومة المتخصصة عن الأصناف القديمة.

Table (1): Reaction of ten-rice isolates on some Egyptian commercial rice cultivars under greenhouse conditions.

Locations	Disouk	Sakha	Sakha	Gemiza	Gimiza	Itai El-baroud	Kafr Sakr	Kafr Sakr	Mansoua	El-simbla-wain
Entries	G. 171	G. 159	IR 10011 (AC)	Aschi Asahi	Reiho	G. 171	G. 171	S. 101	Reiho	G.171
Isolates / Cultivars	275	5	344	383	387	363	52	316	351	339
Giza 159	4	6	5	4	4	5	5	4	4	4
Giza 171	4	6	5	5	5	4	5	4	4	4
Giza 176	0*	4	3	0	3	(4)	4	4	0	4
Reiho	5	7	- **	-	-	0	(4)	-	0	0
Giza 177	0	4	0	0	3	0	4	0	0	0
Giza 178	0	4	0	0	0	0	(4)[1]	0	0	0
Sakha 101	0	(4)	0	0	0	3	0	0	0	0
Sakha 102	3	4	0	0	0	0	(4)	0	0	0
Sakha 103	0	0	3	0	3	0	0	0	0	0
Sakha 104	0	(4)	0	0	4	3	(4)[1]	0	0	0

(4)[1]: One lesion type 4.
(4): Few lesions type 4.
*** : Zero reaction.**
****: Not tested.**

Table (2): Reaction of ten-rice blast isolates on International Differential Varieties (IDV) under greenhouse conditions.

Locations	Disouk	Sakha	Sakha	Gemiza	Gimiza	Itai El-baroud	Kafr Sakr	Kafr Sakr	Mansoura	El-simbla-wain
Entries	G. 171	G. 159	IR 10011 (AC)	Aschi Asahi	Reiho	G. 171	G. 171	S. 101	Reiho	G.171
Isolates / Cultivars	275	5	344	383	387	363	52	316	351	339
Rst. 3	R	4	5	R	R	R	R	R	R	R
Zenith	R	R	5	R	4	R	R	R	R	R
NP-125	R	6	R	4	R	4	R	R	R	R
Usen	R	4	6	R	4	4	R	5	R	4
Dular	R	4	R	R	R	R	R	R	R	R
Kanto 51	R	R	R	R	R	R	R	R	R	R
CI 8970 s	R	5	4	R	R	4	5	R	R	R
Caloro	6	7	6	6	5	4	6	5	R	5
Race	IH-1	IA-69	IA-45	IC-13	IB-47	IC-13	IG-1	ID-15	II	ID-15